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ABSTRACT

The direction and scope of deinstitutionalization in 75 public and 161 community residential programs for mentally retarded people in the Unites States were examined by analysis of current levels of expenditures, projected costs, efficacy of existing funding mechanisms, and identification of critical factors affecting cost variation. Results of a three page self report questionnaire completed by financial officers of each facility included the finding that the largest single expense reported by most facilities was personnel related. Estimates of total revenue, expenses, and capital investments are presented separately for public and community facilities as well as separately by census regions and size categories. Results further revealed that public residential facility per diems were were significantly different when tested for census region differences and varying levels of staff resident ratios. The intensity of staffing and services provided by community residential facilities significantly affected per diems, as did family ownership and the proportion of severely/profoundly mentally retarded residents. Public policy implications are presented in terms of constitutional guarantees and levels of funding; programing requirements and the application of cost functions; and reimbursement patterns, fiscal disincentives, and the future development of community alternatives. (Author/CL)

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DEVELOPMENTAL DISABILITIES PROJECT
ON RESIDENTIAL SERVICES
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Project Report No. 9

The Cost of Public and Community Residential Care for Mentally Retarded People in the United States

Colleen A. Wieck
Robert H. Bruininks

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The Project is supported by a grant (54-P-71173/5-04) from the Administration on Developmental Disabilities, Office of Human Development Services, Department of Health and Human Services. Contractors undertaking such projects under government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent the official position of the Administration on Developmental Disabilities.

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COMMUNITY ADJUSTMENT

Project Report No. 9

The Cost of Public and Community Residential Care for Mentally Retarded People in the United States

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ABSTRACT

Government financing of the long term residential care of mentally retarded people has been a matter of public policy for over 100 years. In the last decade the institutional population has declined while the number of smaller, community based facilities has increased dramatically. The direction and magnitude of this deinstitutionalization movement may be determined in the future by the current levels of expenditures, the projected costs, the efficacy of existing funding mechanisms, and identification of critical factors that affect variations in cost.

An extensive review of the literature revealed that few comprehensive cost studies in the area of residential services for mentally retarded people have been completed on a national or state level. The purpose of the present study was threefold. The first objective was to provide a descriptive profile of the national patterns of revenue, expenses, and capital investments of public and community residential facilities during 1977-1978. The second objective of the study was to provide an analysis of costs by 14 separate locational, organizational, and residential variables. The third objective was the use of cost function analysis to test statistical relationships between and among several independent variables and the dependent variable, per diem cost, using multiple regression techniques.

This study was conducted in collaboration with the Survey Research Center of the University of Michigan. Cost data were collected from

a national probability sample of 75 public residential facilities and 161 community residential facilities selected by the Sampling Section of the Survey Research Center. A three page self report questionnaire designed to assess both revenues and expenses was completed by the most appropriate financial officer of the facility.

The population estimates of total revenue reported by all residential facilities was $3.11 billion with government sources accounting for almost the entire amount. The total expenses of public facilities was $2.735 billion and $518 million for community facilities. The single largest expense reported by most facilities was personnel expenses. Capital investments totaled over $5.3 billion for land and buildings of all public and community residential facilities. Estimates of total revenue, expenses, and capital investments were presented separately for public residential facilities and community residential facilities, as well as separately by census regions and by size categories.

Results from several of the hypotheses tested, indicated public residential facility per diems were significantly different when tested for census region differences and varying levels of staff resident ratios. The intensity of staffing and services provided by community residential facilities significantly affected per diems. Family ownership and the proportion of severely/profoundly mentally retarded residents served also significantly affected per diems. Cost function analyses were performed separately for public and community facilities.

A comprehensive discussion of results was presented including a brief discussion of the difficulty of conducting cost effectiveness

analysis between public and community residential facilities. Several public policy implications were presented in terms of (a) constitutional guarantees and level of funding, (b) programming requirements and the application of cost functions, and (c) reimbursement patterns, fiscal disincentives, and the future development of community alternatives.

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I. INTRODUCTION

Government financing of the long term residential care of mentally retarded people has been a matter of public policy for over 100 years. Historically, mentally retarded people have been treated by diverse government actions and reactions ranging from sheer rejection and isolation in large, public facilities to the modern practice of physically and socially integrating them within local community settings. This latter approach of shifting care from public institutions to smaller, community-based homes and facilities is commonly known as deinstitutionalization, though, as will be discussed later, the term is properly defined much more broadly.

The impetus for significant improvements in the care and treatment of mentally retarded people has come from both the general advancement in national wealth and the changing attitude in society toward dependent people (Mott, 1976). The culminating effect of changing attitudes has been the dramatic expansion of the number of community residential facilities (Bruininks, Hauber, & Kudla, 1979) depicted in Figure 1 and the rapid decline in the number of mentally retarded residents in public institutions (Lakin, 1979) illustrated in Figure 2. Lakin (1979) provided an historical review of demographic trends of public institutions from 1840 to 1978. According to Lakin, the 1880 census counted 2,429 residents in institutions. Steady increases were

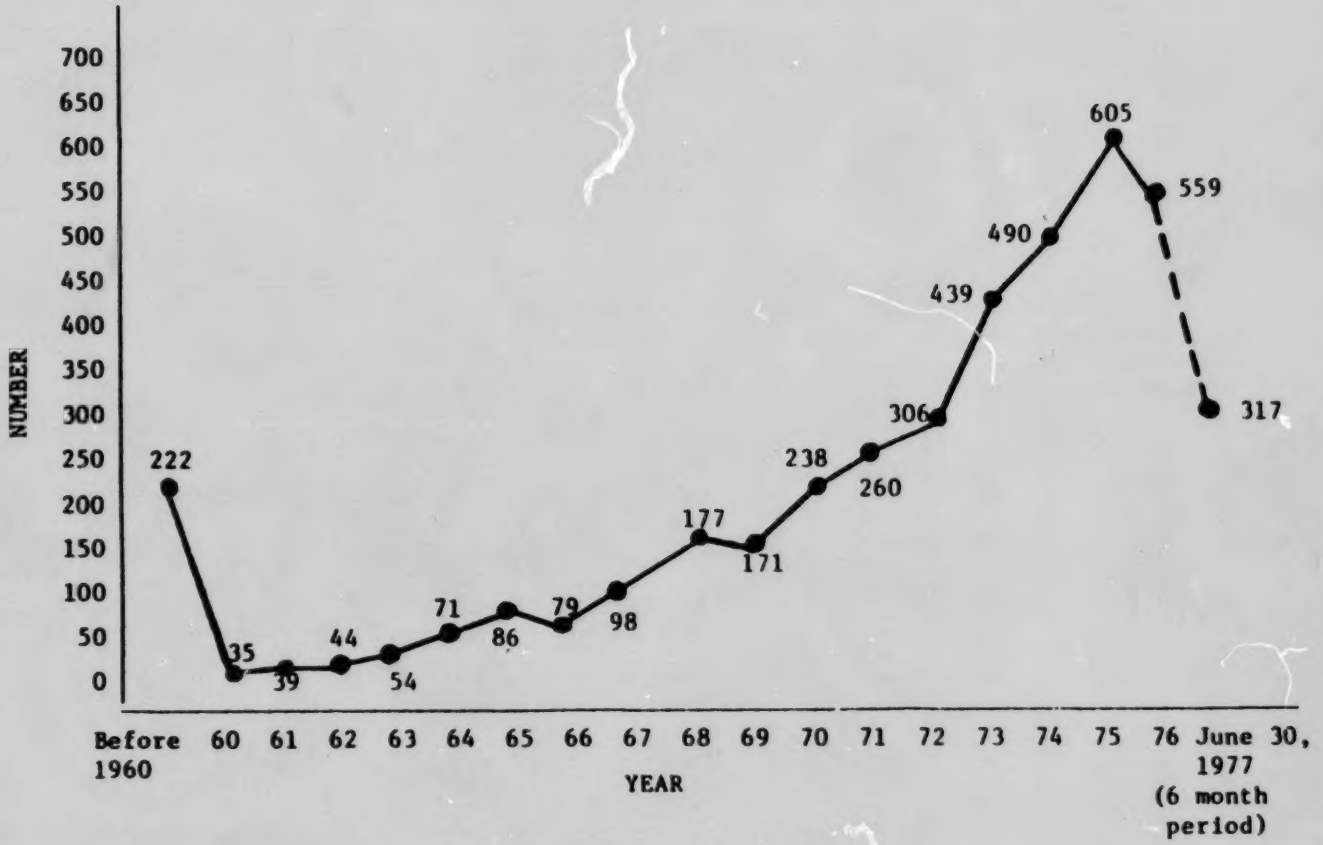

Figure 1. Year of Opening for 4,290 CRFs: United States, 1977 (97% CRFs Reporting) (Bruininks, Hauber, & Kudla, 1979, p. 58)

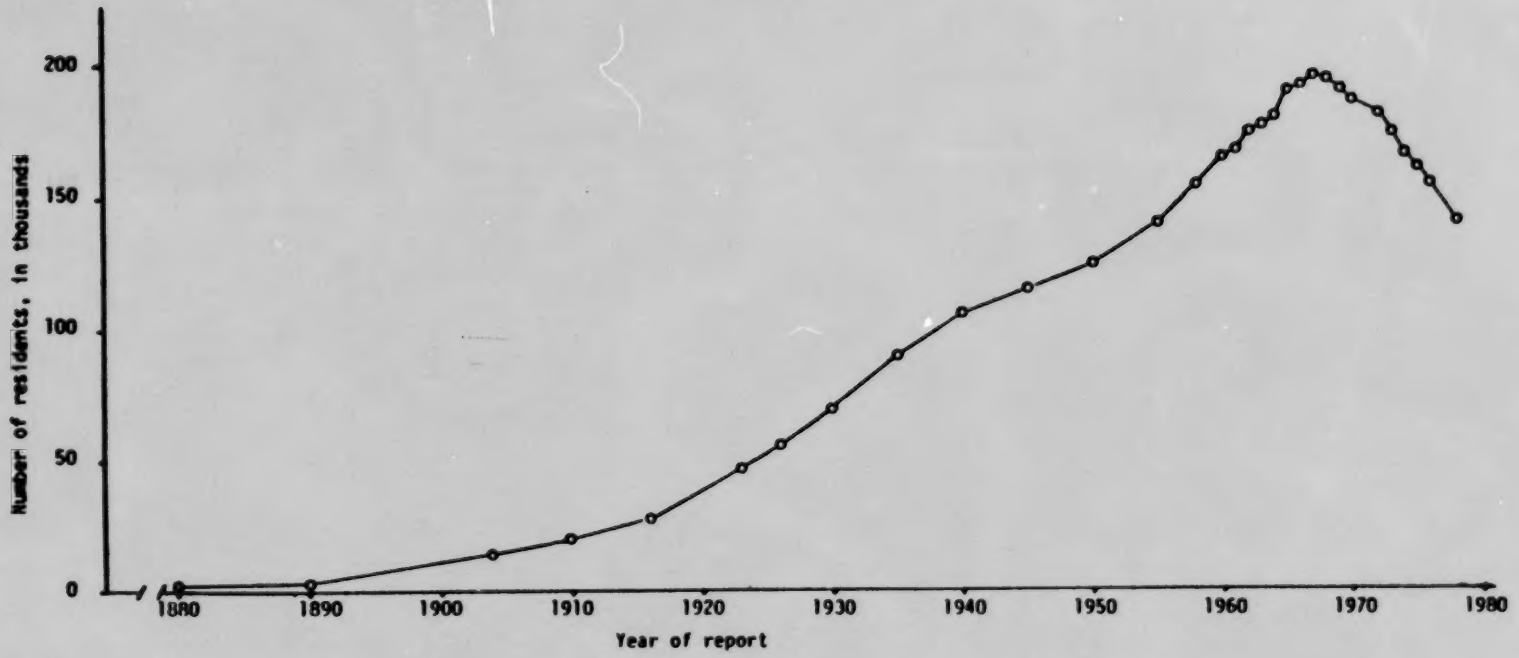

Figure 2. Total Populations of Mentally Retarded People in Public Institutions for the Period 1880 to 1978. (Lakin, 1979, p. 71)

reported from 1880 up to 1967 when the institutional population reached a peak of 194,650. From 1968 to the present, the institutional population has declined.

The direction and magnitude of deinstitutionalization as a public policy may be determined in the future by the current levels of expenditures, the projected costs, the efficacy of existing funding mechanisms, and identification of critical factors that affect cost variation. The purpose of the present study is to describe the level of expenditures for a national probability sample of publicly and privately operated residential programs for mentally retarded people and to identify the critical factors that affected cost variation during 1977-1978.

Within the United States, there are at least five groups concerned with the public policy of deinstitutionalization. Each group including a) legislators, b) executives of government, c) judges, d) interest groups, and e) government workers plays an important role in determining the method, priority, and extent of funding residential service. During policy development, interest groups may disproportionately act and interact to influence the final outcome. As Dror (1968) explained:

> Public policy is a very complex, dynamic process whose various components make different contributions to it. It decides major guidelines for action directed at the future, mainly by government organs. These guidelines (policies) formally aim at achieving what is in the public interest by the best possible means. (p. 12)

The political tension generated by the interaction of these five groups may either agitate or settle the final outcome of laws, regulations, and interpretations.

Presently, the public policy of deinstitutionalization is not clearly articulated, coordinated, or funded. The definitions of residential care alternatives are often arbitrarily distinguished into two major categories: community residential facilities and public residential facilities. Scheerenberger (1978a) offered the following definition of public residential facility: "A state sponsored and administered facility which offers comprehensive programming on a 24-hour, 7 days-a-week basis" (p. 2). In a similar manner, Bruininks, Hauber, and Kudla (1979) defined community residential facility as:

> any community based living quarter(s) which provide 24-hour, 7 days-a-week responsibility for room, board, and supervision of mentally retarded persons as of June 30, 1977 with the exception of (a) single family homes providing services to a relative; (b) nursing homes, boarding homes, and foster homes that are not formally state licensed or contracted as mental retardation services providers; and (c) independent living (apartment) programs which have no staff residing in the same facility. (p. 11)

Due to its fragmentary nature and short life, an evaluation of the merits of deinstitutionalization seems less appropriate than analysis of its components. Dror (1968) proposed several methods of analyzing public policy such as historical analysis of details of a single policy; identification of emerging problems and trends extrapolated to meet future needs; the use of a case study approach that focuses on a substantive area within the policy; identification of key people responsible for policy development in a specific area; or comparison of public policies from the combined perspective of economics and political science. An historical analysis of significant events of deinstitutionalization seems feasible in revealing several elements of

this major social movement. This approach to policy analysis focuses upon what Dror refers to as the key people responsible for the development and management of public policy. Unlike the several reviews to date on this same topic, this review will be presented in historical terms and through an analysis of the five major participating groups in public policy including: a) legislative contributions, b) executive contributions, c) judicial contributions, d) interest group contributions, and e) government workers contributions.

Historical Analysis of Deinstitutionalization as a Public Policy

In reviewing the major milestones of deinstitutionalization, Dybwad (1972) and Lippman and Goldberg (1973) categorized each of the last three decades by a predominant force. Thus, the 1950s were noted as years of legislative action, the 1960s were marked by executive directives, and the 1970s represented an era of litigation and judicial decisions.

The definition for the movement of large numbers of mentally retarded people from public residential facilities to community based alternatives was debated long after the process was underway. Several writers during the 1970s displayed astonishing diversity in defining the phenomenon known as deinstitutionalization.

One of the earliest explanations of the term was offered by Francis X. Lynch, Director of the Division of Developmental Disabilities, Department of Health, Education, and Welfare. In a memo dated

June 11, 1974, Lynch stated:

> Deinstitutionalization is a federally coined term used to characterize one of the Mental Retardation goals expressed by President Nixon in November 1971 (of reducing by one-third the census of state institutions for mentally retarded people).

A recent definition of deinstitutionalization is similar in scope. Bradley (1978) stated, "Deinstitutionalization is the means of removing persons from institutional programs and placing them elsewhere" (p. ix).

Other writers have elaborated upon this explanation. Among them was Horejsi (1975) who defined deinstitutionalization as both a goal and a process. The goal was based on President Nixon's recommendation that at least one-third of those residents in public residential facilities for mentally retarded people could live in community residential facilities. The process component of Horejsi's definition was delineation of four interrelated activities, the first three of which were set forth by the National Association of Superintendents of Public Residential Facilities for the Mentally Retarded (1974):

1. prevent admission of people to public residential facilities by finding and developing alternative community residential facilities;

2. return to community residential facilities all public residential facility residents who have been prepared through programs of habilitation and training to function in appropriate local settings;

3. establish and maintain responsive residential environments which protect human and civil rights and which contribute to expeditious return of the individual to normal community living whenever possible;

4. promote public acceptance of retarded persons as neighbors, employees, and citizens possessing their human and civil rights. (p. 5)

Horejsi cautioned that deinstitutionalization should not be construed to mean institutional reform (modification or improvement of attitudes, philosophy, policies, utilization of resources, and financing to assist mentally retarded individuals), nor should it be confused with decentralization (breaking up large public residential facilities into smaller, more manageable units).

Bachrach (1976) expanded the definition of deinstitutionalization to three components stating that it was a process, fact, and philosophy. She argued that the process of deinstitutionalization was the "eschewal, shunning, or avoidance of traditional institutional settings . . . and the concurrent expansion of community based facilities" (p. 1). Deinstitutionalization as a fact refers to the nationwide statistical evidence that use of state hospitals has decreased while community residential facility alternatives have expanded. Finally, the philosophical basis of deinstitutionalization reflects the ideology of the times. Bachrach cited both "the strong civil libertarian emphasis on the rights of mental patients . . . with the emphasis for amelioration (moving away from) the individual and toward modification of the environment" (pp. 5-6).

The discourse on definition of deinstitutionalization is primarily limited to researchers and government officials charged with interpretation of laws and executive orders. In contrast with this limited scope of activity, the chronological events leading to the public policy of deinstitutionalization involve at least five basic contributing parties. Table 1.1 presents a chronological summary of events

from mid-19th century with identification of the contributing source provided in several columns labeled legislative, executive, judicial, interest groups, and government workers.

The legislative contributions refer to action by the U.S. Congress. Central to the commitment of the government to aid dependent people has been the annual expenditure of public funds for institutions and other residential alternatives. Appropriation of funds is a legislative prerogative that has shifted from primarily a state responsibility to a shared venture with the federal government, particularly during the 1970s.

Executive contributions refer to Presidential initiatives in issuing Executive orders, appointing commissions to study the needs of mentally retarded people, and presenting legislative recommendations to Congress.

Judges can and do make public policy by extracting applicable principles from previous case law, principles from the U.S. Constitution and federal law, and often interpreting these principles in the context of core social values. This approach is unique from the other methods of formulating public policy since judges are charged with the responsibility of insuring laws are uniform, impartial, and devoid of prejudice. The core social values that judges call upon such as equal justice, right to treatment, protection from harm, and the right to reside in the least restrictive environment have particular significance for deinstitutionalization. Table 1.1 presents several landmark decisions that assert the constitutional rights of mentally retarded people.

Table 1.1

Historical Events Comprising Public Policies toward Residential Services and Deinstitutionalization in the United States

Year	Event	Agency/Individual	L	E	J	I	G	Reference
1850-1875	Era marked by the belief that mentally retarded people were capable of learning and could be cured by special training.	Edouard Sequin, President, American Association of Medical Officers of American Institutions				X		Sloan & Stevens, 1976, p. 5; Wolfensberger, 1976, p. 69.
1875-1900	Considerable evidence that mentally retarded people could not be cured by special training. The concept of the state school changed to the idea that it was an asylum for incurables. Some pupils known as the "untrainables" were regarded as people who would remain in institutions and never return to the community.	Frederick Kuhlmann, President, American Association of Medical Officers of American Institutions				X		Sloan & Stevens, 1976, p. 171.
1893	Fernald proposed a financial basis for building more institutions. "This special care [given by institutions] is now recognized as not only charitable, but economical and conservative. Each hundred dollars invested now saves a thousand in the next generation."	Walter E. Fernald				X		Wolfensberger, 1976, p. 62.
1900-1925	State schools abandoned original objectives and became state institutions for permanent commitment of mentally retarded persons. Industrial training programs expanded. Era marked by introduction of intelligence testing movement.	Frederick Kuhlmann, President, American Association on Mental Deficiency				X		Sloan & Stevens, 1976, p. 172.
1916	The annual cost per resident hovered between $150-200 during the late 1800s leading Cornell to observe, "Until we get the per capita cost of the 'high grade feebleminded' down less than $100 per year, there will be objection to their segregation on the grounds of expense."	W. S. Cornell, National Conference of Charities and Corrections				X		Wolfensberger, 1976, p. 66.
1925-1950	Almost every state supported at least one institution. The number of residents increased from 25,000 to 50,000 during this period. The colony plan was introduced as well as the idea of parole and extra institutional care.	Frederick Kuhlmann, President, American Association on Mental Deficiency				X		Sloan & Stevens, 1976, p. 172.
1946	National Mental Health Act established the National Institute of Mental Health and provided grants for community mental health services.	U.S. Congress	X					General Accounting Office, 1977, p. 204.
1950	The National Association for Retarded Citizens was founded. One of the primary missions was, "to promote the general welfare of the mentally retarded of all ages everywhere: at home, in the community, in institutions, and in public, private, and religious schools."	Board of Directors, National Association for Retarded Citizens				X		National Association for Retarded Citizens, 1976, p. 3.
1950	Midcentury objectives were established by the American Association on Mental Deficiency which called for: 1) provision of adequate and suitable facilities and provisions for the care and training of the mentally deficient; 2) community placement and supervision of suitable institutional and special class trained children as long as they can and do adjust to community life.	Executive Council, American Association on Mental Deficiency				X		Sloan & Stevens, 1976, p. 205.

L=Legislators; E=Executives; J=Judges; I=Interest Groups; G=Government Workers

Table 1.1 (continued-2)

Historical Events Comprising Public Policies toward Residential Services and Deinstitutionalization in the United States

Year	Event	Agency/Individual	L	E	J	I	G	Reference
1950-1954	The National Association for Retarded Citizens conducted a mass communication campaign educating the public about mentally retarded people. This led to the first Presidential Proclamation on the issue by Dwight D. Eisenhower.	National Association for Retarded Citizens and President Dwight D. Eisenhower		X		X		Lippmann, 1976, p. 98.
1954	Two trends were identified by the President, American Association on Mental Deficiency: (a) the increased emphasis on education and training of mentally retarded residents and (b) the increased proportion of severely retarded residents in state schools. He cautioned against both trends citing that "medicine, not education will find the final answers." He also advised that money for research should have priority over spending funds on severely retarded residents.	Arthur T. Hopwood, President, American Association on Mental Deficiency				X		Sloan & Stevens, 1976, p. 216.
1955	American Association on Mental Deficiency President, Gale N. Walker, criticized the status of residential care provided to mentally retarded people. He cited the types of names used for institutions; the need to build home-like settings; and the barren, unattractive interiors. There were critical shortages of bed space and personnel at that time. The care of the mentally retarded person has been primarily politically expedient rather than what is professionally possible. He also noted that the National Association for Retarded Citizens was influencing policy more than the American Association on Mental Deficiency.	Gale N. Walker, President, American Association on Mental Deficiency				X		Sloan & Stevens, 1976, p. 219.
1956	The President of the American Association on Mental Deficiency noted that in several states "there is evidence of political interference in institutions, especially in areas of staffing, operation, and admission."	Arthur E. Westwell, President, American Association on Mental Deficiency				X		Sloan & Stevens, 1976, p. 228.
1961	E. L. Johnstone, President, American Association on Mental Deficiency advocated that institutions should have three divisions--research, training, and permanent care for adults who would make industrial contributions to the institution and state that protected and trained them. The same idea had been presented by the President's father in a similar address in 1928.	Edward L. Johnstone, President, American Association on Mental Deficiency				X		Sloan & Stevens, 1976, p. 241.
1962	Report of President's Panel on Mental Retardation entitled A proposed program for national action to combat mental retardation concluded that state institutions should upgrade the quality of services and local communities were encouraged to work with federal and state agencies to provide comprehensive, community-based facilities and services.	President John F. Kennedy		X				General Accounting Office, 1977, p. 255.
1963	The President's First Separate Special Message to Congress on Mentally Ill and Mentally Retarded called for a national program to combat both conditions.	President John F. Kennedy		X				General Accounting Office, 1977, p. 206.

L=Legislators; E=Executives; J=Judges; I=Interest Groups; G=Government Workers

Table 1.1 (continued-3)

Historical Events Comprising Public Policies toward Residential Services and Deinstitutionalization in the United States

Year	Event	Agency/Individual	L	E	J	I	G	Reference
1963	Mental Retardation Facilities and Community Mental Health Center Construction Act of 1963 authorized funds for construction of community based mental health centers and facilities for the mentally retarded (PL 88-164).	U.S. Congress	X					General Accounting Office, 1977, p. 207.
1963	American Association on Mental Deficiency President Sloan warned against the problems of overgeneralization, particularly, that large institutions were inherently bad. "It might be true, but it was not certain," stated Sloan.	William Sloan, President, American Association on Mental Deficiency				X		Sloan & Stevens, 1976, p. 268.
1965	Senator Robert F. Kennedy toured Willowbrook State School and his shocked reaction gained mass media coverage. "We have a situation that borders on a snake pit... the children live in filth."	U.S. Congress	X					Shearer, 1976, p. 114.
1965	Social Security Amendments of 1965 enacted both the Medicare and Medicaid programs.	U.S. Congress	X					General Accounting Office, 1977, p. 207.
1965	Federal Assistance to State Operated and Supported Schools for the Handicapped authorized federal grants to states for educating handicapped persons in state schools.	U.S. Congress	X					General Accounting Office, 1977, p. 209.
1965	Vocational Rehabilitation Act Amendments of 1965 authorized construction of community residences for mentally retarded persons receiving vocational rehabilitation services in sheltered workshops (PL 89-333).	U.S. Congress	X					General Accounting Office, 1977, p. 210.
1966	Executive Order 11280 established the President's Committee on Mental Retardation	President Lyndon B. Johnson		X				General Accounting Office, 1977, p. 210.
1967	Mental Retardation Amendments of 1967 authorized staffing grants for community facilities for mentally retarded people for a 51-month period (PL 90-170).	U.S. Congress	X					General Accounting Office, 1977, p. 210.
1969	American Association on Mental Deficiency President Koch boldly proclaimed that the large, isolated medical facility for the mentally retarded was a mistake. He also argued that services for mentally ill and mentally retarded residents should be separated.	Richard Koch, President, American Association on Mental Deficiency				X		Sloan & Stevens, 1976, p. 270.
1970	Developmental Disabilities Services and Facilities Construction Amendments of 1970 provided formula grants to states for comprehensive planning. The House Committee urged improved institutions and development of alternative community based residential facilities and day care programs (PL 91-517).	U.S. Congress	X					General Accounting Office, 1977, p. 211.
1970	Report of the President's Task Force on the Mentally Handicapped placed emphasis on community based care and expanded coverage of mentally disabled persons under Medicare and Medicaid.	President Richard M. Nixon		X				General Accounting Office, 1977, p. 211.
1970	Housing and Urban Development Act required HUD to encourage development of residential settings to accommodate special needs of handicapped persons (PL 91-152).	U.S. Congress	X					General Accounting Office, 1977, p. 211.

L=Legislators; E=Executives; J=Judges; I=Interest Groups; G=Government Workers

Table 1.1 (continued-4)

Historical Events Comprising Public Policies toward Residential Services and Deinstitutionalization in the United States

Year	Event	Agency/Individual	L	E	J	I	G	Reference
1971	Presidential Statement on Mental Retardation established a national goal of returning one-third of 200,000 mentally retarded people in public institutions to residential placements in the community. The Justice Department was directed to initiate action to strengthen full legal rights for mentally retarded people.	President Richard M. Nixon		X				General Accounting Office, 1977, p. 212.
1970s	Advances in behavioral technology and its application to teaching mentally retarded people aided in advancement of training of independent living skills necessary for placement in community settings.	University researchers such as B. F. Skinner				X		Horejsi, 1975, p. 7.
1971	Amendments to Social Security Act authorized residential care in "Intermediate Care Facilities" under Medicaid (PL 92-223).	U.S. Congress	X					General Accounting Office, 1977, p. 212.
1971	Pennsylvania Association for Retarded Citizens v. Commonwealth of Pennsylvania was a landmark decision affirming the handicapped child's right to education at public expense and his right to certain procedural or due process safeguards.	U.S. District Court			X			Braddock, 1977, p. 14.
1972	Amendments to Social Security Act established Supplemental Security Income program to federalize and standardize state assistance programs for the aged, blind, and disabled (PL 92-603).	U.S. Congress	X					General Accounting Office, 1977, p. 213.
1972	Wyatt v. Stickney ruled that mentally ill and mentally retarded people have a constitutional right to treatment in the least restrictive setting necessary.	U.S. District Court			X			General Accounting Office, 1977, p. 213; Gilhool, 1976, p. 169.
1973	The normalization principle was defined as it applies to residential services. The National Association for Retarded Citizens promulgated this principle widely.	Wolf Wolfensberger				X		Wolfensberger, 1972; Horejsi, 1975, p. 8.
1973	Rehabilitation Act of 1973 gave priority for vocational rehabilitation services to the most severely disabled first. Section 504 of this act prohibits discrimination against handicapped people.	U.S. Congress	X					General Accounting Office, 1977, p. 214.
1974	Rehabilitation Act Amendments of 1974 authorized a White House Conference on Handicapped Individuals and established the policy that all levels of government should work to enable handicapped individuals to live independently and with dignity.	U.S. Congress	X					General Accounting Office, 1977, p. 215.
1974	Housing and Community Development Act of 1974 changed the program definition of HUD to include developmentally disabled people (PL 93-383).	U.S. Congress	X					General Accounting Office, 1977, p. 216.
1974	Welsch v. Likens in Minnesota affirmed that mentally retarded people have a constitutional right to treatment and in the least restrictive alternative.	U.S. District Court			X			General Accounting Office, 1977, p. 216.
1974	U.S. v. Solomon was the first class action suit initiated by the U.S. Department of Justice on behalf of mentally retarded people in institutions to receive treatment.	U.S. District Court			X			General Accounting Office, 1977, p. 216.

L=Legislators; E=Executives; J=Judges; I=Interest Groups; G=Government Workers

Table 1.1 (continued-5)

Historical Events Comprising Public Policies toward Residential Services and Deinstitutionalization in the United States

Year	Event	Agency/Individual	L	E	J	I	G	Reference
1974	President Rosen, American Association on Mental Deficiency, noted the number of increased discharges from institutions to community facilities. He advocated limits on new admissions to institutions and creative planning for future living alternatives. "The setting that may seem appropriate today, may be too restrictive tomorrow."	David Rosen, President, American Association on Mental Deficiency				X		Sloan & Stevens, 1976, p. 285.
1974	Executive Order 11776 reaffirmed the national goal of returning one-third of the mentally retarded residents in institutions to community settings.	President Richard M. Nixon		X				General Accounting Office, 1977, p. 216.
1974	Presidential Statement on Mental Retardation pledged the federal government's initiative in finding suitable housing for retarded adults but urged local levels to provide the real help.	President Richard M. Nixon		X				General Accounting Office, 1977, p. 217.
1975	Social Services Amendment of 1974 (Title XX) became the social services program established to help dependent people (a) achieve or maintain self sufficiency, (b) prevent or reduce inappropriate institutional care, and (c) secure institutional care only when appropriate.	U.S. Congress	X					General Accounting Office, 1977, p. 217; Mott, 1976, p. 49.
1975	Developmentally Disabled Assistance and Bill of Rights Act required states to prepare plans outlining community alternatives to institutionalization (PL 94-103).	U.S. Congress	X					General Accounting Office, 1977, p. 218.
1975	Education for All Handicapped Children Act of 1975 (PL 94-142) authorized handicapped children to receive a free appropriate public education to meet individual needs in the least restrictive environment.	U.S. Congress	X					General Accounting Office, 1977, p. 219.
1975	New York State Association for Retarded Citizens v. Carey ordered that residents of Willowbrook had a constitutional right to treatment in the least restrictive setting. It also ordered reduction of the Willowbrook population and concurrent development of community placements.	U.S. District Court			X			General Accounting Office, 1977, p. 219.
1975	Horacek v. Exon ordered reduction of Nebraska's institutions and established three year goals to accomplish the reduction.	U.S. District Court			X			General Accounting Office, 1977, p. 221.
1976	General Accounting Office issued a report based on 18 months of investigation designed to assess the impact of federal programs on deinstitutionalization. The report noted that deinstitutionalization programs were often too piecemeal and fragmented to ensure service delivery in the least restrictive setting.	General Accounting Office					X	Braddock, 1977, pp. 16-18.
1976	O'Connor v. Donaldson established grounds for commitment either as (a) danger to self or others, or (b) incapable of surviving safely in the community with family or friends. Also guaranteed regular review of necessity for resident institutionalization. This case recognized the full constitutional rights of handicapped citizens	U.S. District Court			X			Bradley, 1978, p. 140.

L=Legislators; E=Executives; J=Judges; I=Interest Groups; G=Government Workers

Table 1.1 (continued-6)

Historical Events Comprising Public Policies toward Residential Services and Deinstitutionalization in the United States

Year	Event	Agency/Individual	L	E	J	I	G	Reference
1977	Medicaid Intermediate Care Facility-Mentally Retarded regulations were promulgated in 1974 and became operational in March 1977. The result of these regulations according to Bradley, "In order to maintain Medicaid support for their institutional systems, states are being forced to accelerate the movement of clients out of institutions in order to concentrate limited state financial resources on the improvement of physical facilities and staff ratios for those residents who remain."	U.S. Department of Health, Education, and Welfare					X	Bradley, 1978, pp. 6-7.
1977	Halderman and the United States v. Pennhurst State School and Hospital held that residents of Pennhurst have a right under the due process clause of the 14th Amendment to habilitation in the least restrictive setting. The court also held that mentally retarded people should not be segregated in an institution that does not meet minimally adequate standards. In March 1978, the court ordered that suitable community living arrangements must be provided as well as individual habilitation plans. In effect, Pennhurst was ordered to close.	U.S. District Court			X			President's Committee on Mental Retardation, 1978, p. 16.
1978	Florida passed the Retardation and Prevention Act placing priority on community based programs: "...unnecessarily placing clients in large, state institutions, are unreasonably costly, are ineffective in bringing the individual client to his or her maximum potential, and are in fact debilitating to a great majority of clients."	Florida State Legislature	X					National Center for Law & the Handicapped, 1978, p. 13.
1978	A new definition of developmental disability eliminated the delineation of handicapping conditions--mental retardation, cerebral palsy, epilepsy, and autism and replaced the categorical approach with a broader definition.	U.S. Congress	X					National Center for Law & the Handicapped, 1979, p. 3.
1979	National mail survey of community and public residential facilities was undertaken by the Developmental Disabilities Project on Residential Services and Community Adjustment in 1977. Results published in 1979 noted a dramatic increase in community residential facilities (see Figure 1).	University of Minnesota					X	Developmental Disabilities Project, 1979, p. 2.

L=Legislators; E=Executives; J=Judges; I=Interest Groups; G=Government Workers

Interest groups representing both professional and consumer functions of residential care in the United States often precipitate and cause government action. Two groups, the American Association on Mental Deficiency (AAMD) and the National Association for Retarded Citizens (NARC), represent the day to day leadership of groups most concerned with residential care for mentally retarded people. The recapitulation of historical events from 1850-1950 from the viewpoint of the American Association on Mental Deficiency sets an appropriate backdrop for a closer review of events during the last three decades.

Government workers are responsible for the implementation of public policy through interpretation and promulgation of regulations related to public law. Several departments in the United States share responsibility for any public policy, and in the case of residential care for mentally retarded people there are at least "135 federal programs administered by 11 major departments and agencies" responsible for aspects of deinstitutionalization (General Accounting Office, 1977, p. 184).

Outcomes of Deinstitutionalization: Cost as a Critical Problem

Blatt, Bogden, Biklen and Taylor (1976) suggested that if the public policy of deinstitutionalization was not reconceptualized, the movement would fail as a result of inertia or backlash. Bradley (1978) asserted that deinstitutionalization as a public policy has reached adolescent maturity restrained from further development by "lack of a systematic or integrated approach to the improvement of programs for

developmentally disabled persons" (p. 7). Braddock (1977) similarly charged that federal actions to date should only be considered as ad hoc outputs not public policy:

> The federal stance toward deinstitutionalization is inchoate, evolving piecemeal, and the actions we highlight lack necessary coherence to be described accurately as a federal "policy" in this area. (pp. 10-11)

Dozens of unintended outcomes have emerged during recent years to indicate growing discomfort with the policy of deinstitutionalization. Bradley (1978) enumerated the following list:

> -Parents have expressed some insecurity about the stability of community services.
>
> -State and local governments have complained about the need to use several funding sources in a piecemeal fashion all of which have "requirements" or require categorical funding.
>
> -State institution employees have become angry about job insecurity and loss of work issuing propaganda that proclaims institutions are better able to provide care and stability to residents than private, proprietary agencies.
>
> -Accountability fluctuates when several, smaller facilities outnumber the monitoring capability of state agencies.
>
> -In some states, the role of the private sector is avoided and private, proprietary facilities are prohibited. (p. 9)

One of the most prominent obstacles in development of community residential alternatives has been funding (Popp, 1978, p. 37). Although several landmark judicial decisions have ordered massive changes in the delivery of services to mentally retarded residents, litigation does not insure appropriate services will be available.

Legislators have not always appropriated funding to match the intent or requirements of judicial orders.

Bachrach (1976) observed, "the deinstitutionalization movement seems to be encountering fiscal problems" (p. 14). Concerns about the financial plight of deinstitutionalization are plagued by inadequate data related to the costs of residential care (Kirk & Therrien, 1975). Economic considerations have paramount importance to the public policy of deinstitutionalization but have received little attention by researchers (Bruininks, Thurlow, Thurman, & Fiorelli, 1980; O'Connor, 1976). As a result of this neglect, the President's Committee on Mental Retardation (1976) found it impossible to gather comparable state information on the costs of services to mentally retarded people:

> Amazingly little nationwide data is available from which program trends can be extrapolated and implications drawn. . . . And yet, everyday decisions on the allocation of public resources are made by national and state policy-makers based on little more than rudimentary assumptions about what is happening in the field. (p. 1)

Opinions about costs of residential services abound, while rigorous studies remain difficult to design, implement, and evaluate. In addition to methodological problems, Intagliata, Willer, and Cooley (1979) noted that this paucity may be due to reticence of researchers who fear discussion of costs would replace the issue of human rights in determining the breadth of residential alternatives. O'Connor (1976) did not publish cost data collected on 611 community residential facilities because of mixed methodological and humanitarian concerns:

> Regardless of the outcome of this type of comparison, humanitarian concerns and civil rights advocacy may override economic consideration. Even if a full range

> of community services costs more, human consideration is likely to continue to be a motivational force and its effective implementation will require a knowledge of costs to allow proper allocation and utilization of funds at all levels both public and private. (p. 34)

The dilemma of moral and economic considerations not only touches upon researchers but also manifests itself with the other major participants of public policy. Legislators, executives, judges, interest groups, and government workers have all faced and debated the delicate balance of costs and moral benefits. In an era of fiscal neoconservatism, the allocation of scarce resources will depend upon sound planning and management approaches. Cost was identified as an important tool for "program planning, management, financing, and evaluation" in 1977 by the General Accounting Office (p. 6). Noting that the state of the art in determining costs of residential alternatives had not been adequately developed at that time, the report recommended:

> In view of federal legislation and court decisions, however, the most important question appears to be how to most cost effectively serve mentally disabled persons in the least restrictive environment appropriate to their needs. (p. 6)

Statement of the Problem

During the last decade, significant changes have occurred in the approach and delivery of residential services to mentally retarded people. As an alternative to institutionalization, community residential services have expanded rapidly. The trend of substantial decreases in resident population of state institutions accompanied by rapid increases in community residential placements has been documented by several

recent surveys (Bruininks, Hauber, & Kudla, 1979; Scheerenberger, 1978a, 1979).

The continued shift of emphasis toward community residential alternatives will depend upon comprehensive, accurate financial information regarding the relative costs of care in public and community residential facilities. The importance of this study cannot be overemphasized. Knowledge of expenditures is the first step in understanding the progress toward implementation of deinstitutionalization as a public policy. As Caiden (1978) aptly summarized, "Expenditures represent the difference between lip service and hard fact" (p. 4).

Up to the present time, there are at least three major issues that remain unknown about costs of residential services.

1. There is no national descriptive information about the costs of community and public residential care (PCMR, 1976; Caiden, 1978).
2. There has been no comprehensive study of single factors that are associated with the cost of residential care. The studies completed thus far tend to focus only on one or two variables rather than an extensive analysis of locational, organizational, and resident dimensions.
3. Cost function models in education and health care areas have not been adapted for use in cost studies of residential facilities for mentally retarded people. Little attention has been paid to the relationships that may exist among and between a large set of predictors, such as locational,

organizational, and resident variables, and the cost of residential care for mentally retarded people.

These three gaps of information serve as the basis of this study. The purpose of the present investigation is to approach the topic of costs from a public policy perspective. Government officials require cost information for evaluation of past efforts toward deinstitutionalization and for future planning of expanded residential alternatives. The first objective of this study is to provide a descriptive profile of the national patterns of revenue and expenditures of community and public residential facilities during 1977-1978. Evaluation of the efforts of deinstitutionalization depends upon an accurate picture of current revenue and expenditures. No national study has ever been previously completed which provides the detailed profile of costs that the current study affords.

The distribution and location of residential services are controlled in part by state rules, regulations, and zoning laws. There are several areas open to regulation which may or may not affect costs. These administrative matters can be examined in light of growing concern for projecting future costs and planning for future expansion of community residential alternatives. The second objective of this study is to provide an analysis of costs by locational, organizational, and resident variables. The selection of the factors is guided by philosophical, regulatory, and research concerns regarding the size, staffing patterns, and location of residential facilities. Government officials can regulate and manage residential facilities by directly manipulating each of these selected factors.

The second objective of this study will be to test hypotheses about the relationship of selected locational, organizational, and resident factors with cost. These hypotheses include:

Locational Factors

1. H_{o1}: There is no difference in the per diem rates of residential services located in the four census regions (Northeast, North Central, West, and South).
2. H_{o2}: There is no difference in the per diem rates of residential services located in metropolitan and nonmetropolitan areas.

Organizational Factors

3. H_{o3}: There is no relationship between per diem rates of residential services and size (number of residents).
4. H_{o4}: There is no relationship between per diem rates of residential services and the turnover rates of direct care staff.
5. H_{o5}: There is no relationship between per diem rates of residential services and the staff-resident ratio.
6. H_{o6}: There is no relationship between per diem rates of residential services and the index of service/staffing patterns.
7. H_{o7}: There is no difference in the per diem rates of residential services and the occupancy rate.
8. H_{o8}: There is no difference in per diem rates of community residential facilities by type of legal ownership.

9. H_{o_9}: There is no difference in per diem rates of community residential facilities by membership in a system. (A system is a group of residential facilities owned and operated by one parent organization.)

10. $H_{o_{10}}$: There is no difference in the per diem rates of residential services and the number of years in operation.

Resident Factors

11. $H_{o_{11}}$: There is no difference in the per diem rates of residential services and the age of residents served.

12. $H_{o_{12}}$: There is no difference in the per diem rates of residential services and the level of mental retardation of residents served.

13. $H_{o_{13}}$: There is no difference in the per diem rates of residential services and the proportion of severely/profoundly mentally retarded residents served.

The third and final objective of this study will be development of an explanation of cost relationships using a cost function approach. A cost function is the testing of statistical relationships between inputs or independent variables and cost or the dependent variable using multiple regression techniques. The input factors will be selected from three major categories including locational factors, organizational factors, and resident factors. Results from the second objective of this study will be used in making decisions for inclusion in the multiple regression analysis. Separate cost function analyses will be run for public and community residential facilities.

II. REVIEW OF LITERATURE

Few comprehensive cost studies have been completed at a national or state level. Of those states which have issued reports, the scope of these studies is often restricted. Although underdeveloped, the existing literature does provide insight into the design requirements of future cost analysis studies. To provide a cohesive structure for the review of literature, three major categories have been selected: a) cost studies related to public residential facilities, b) cost studies of community residential facilities, and c) cost comparison studies of community and public residential facilities. The fourth section of this chapter will focus on cost functions of human services as a model for a third level of analysis in this study.

Public Residential Facility Cost Studies

Providing care for mentally retarded people in institutions is expensive and will become even more costly in the future. Baumeister (1970) estimated that "more money is spent on the five percent of the mentally retarded people who are institutionalized than upon the 95 percent who are not" (p. 22).

Lakin (1979) summarized the average annual per capita expenditures for public residential facilities serving mentally retarded people between 1915 and 1978. Table 2.1 presents these annual per capita

Table 2.1

Annual Per Capita Costs for Residents of Public Institutions for the Mentally Retarded 1915-1978[a]

Year	Cost	Cost (1967=$1.00)	Year	Cost	Cost (1967=$1.00)
1915	182.52	600.39	1952	1112.50	1399.52
1922	309.81	606.28	1953	1186.83	1481.16
1927	304.02	584.65	1954	1204.07	1495.45
1928	300.67	586.10	1955	1285.50	1603.02
1929	281.10	547.95	1956	1394.34	1713.23
1930	265.05	530.10	1957	1507.13	1787.46
1931	287.85	631.25	1958	1596.47	1843.92
1932	262.57	641.98	1959	1746.92	2000.22
1933	238.24	641.02	1960	1867.70	2104.90
1934	236.87	590.70	1961	1916.12	2138.39
1935	252.22	613.67	1962	2033.96	2245.49
1936	259.06	624.24	1963	2130.38	2324.24
1937	278.59	647.88	1964	2208.19	2376.01
1938	283.43	671.64	1965	2361.08	2498.02
1939	288.05	692.43	1966	2619.81	2695.78
1940	291.13	693.17	1967	2965.33	2695.33
1941	287.98	653.02	1968	3471.99	3332.04
1942	315.29	646.09	1969	3995.58	3638.96
1943	347.48	670.81	1970	4634.85	3985.25
1944	365.20	692.98	1971	--	--
1945	386.11	716.35	1972	--	--
1946	433.79	741.52	1973	--	--
1947	527.91	789.10	1974	9937.50	6728.17
1948	631.38	875.92	1975	--	--
1949	697.72	977.51	1976	13052.30	7655.31
1950	745.60	1034.15	1977	--	--
1951	807.11	1037.14	1978	18286.65	9377.77

[a]Lakin, 1979, p. 97.

costs in both actual and real dollars (1967), while Figure 3 depicts graphically the steady increase in costs.

Considerable variability in state expenditures for operation of institutions was reported by Baumeister (1970). For example, in 1966 five states spent less than $4.00 per day compared with over $10.00 per day spent by five other states. Moreover, per capita expenditures were found to be dependent upon the size of the institution and the type of patient served. Southern states generally expended the least amount of money per patient. Baumeister also noted that small institutions had higher per capita costs than larger facilities.

Conley (1973) provided an economist's viewpoint on the aggregate costs of public residential facilities. Faced with two serious problems of data collection, Conley relied upon personal estimation. First, the number of mentally retarded people served by residential programs was not available and had to be estimated. Second, there was no meaningful coordination of large amounts of statistical cost data. In particular, Conley found that several statistical surveys gathered information but yielded no comprehensive, comparable national figures.

By necessity, Conley assumed the following: a) the average cost of care for mentally retarded people was the same as for mentally ill people when a facility served both types of residents; b) inpatient care in residential treatment centers was twice as costly as outpatient care; c) the average maintenance costs increased in private mental hospitals and residential treatment centers at the same rate as public mental hospitals; d) the number of mentally retarded persons in

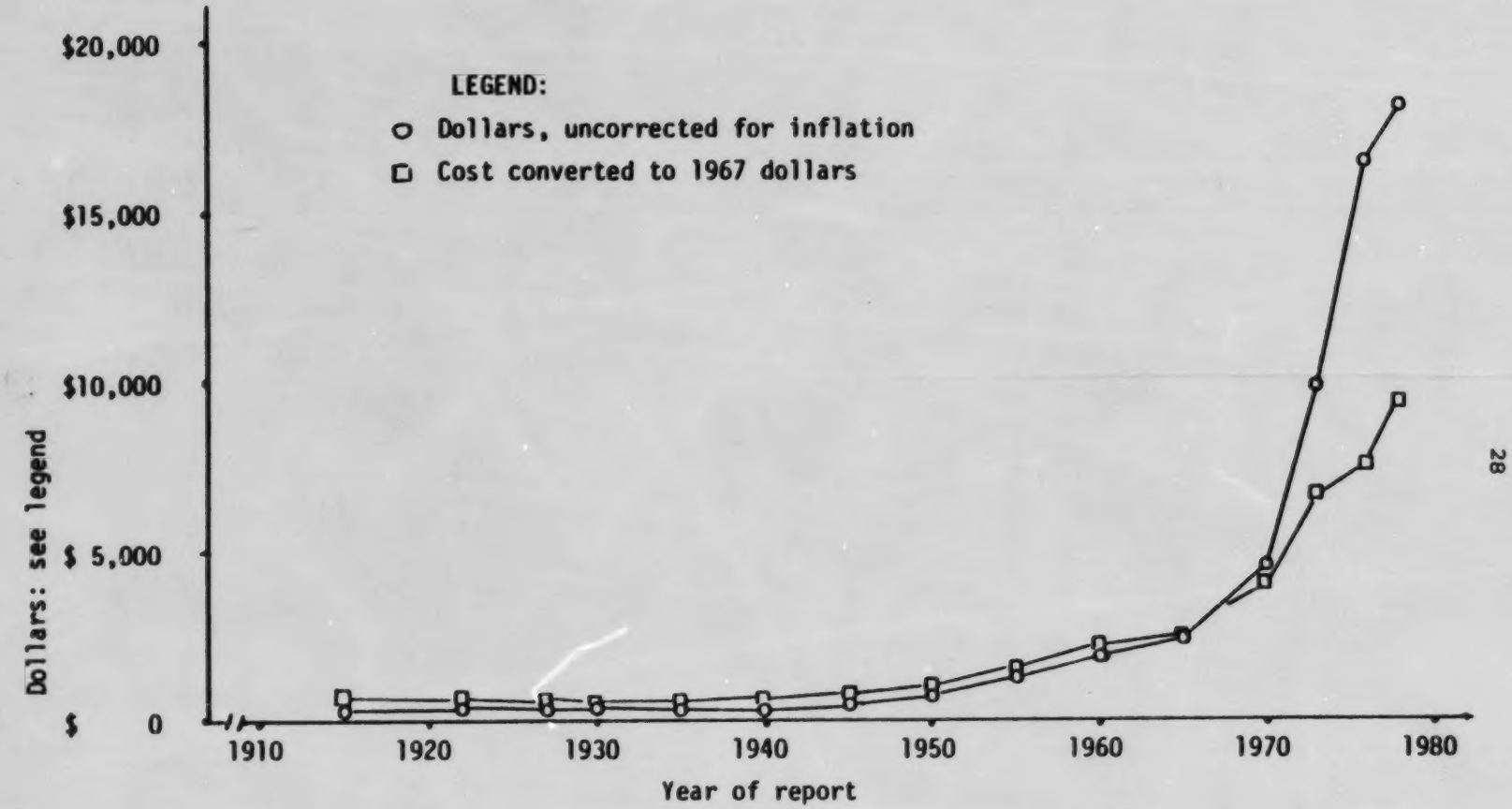

Figure 3. Annual Cost Per Resident of Care in Public Institutions for the Mentally Retarded for the Years 1915 to 1978. (Lakin, 1979, p. 98)

private mental hospitals and residential treatment centers in 1970 was assumed to be equal to the number in 1969; and e) in order to make estimates of capital costs of existing private facilities, data from new construction under the Mental Retardation Construction Program were used. The average capital investment per patient was slightly over $9,000 but a lower figure of $7,500 was used for private residential facilities because they tended to be located in areas accessible to generic services (hospitals, laundries, and repair shops) and partly because they tended to use less expensive construction methods. Conley applied an average cost of $15,000 per bed to estimate the capital value of public institutions.

Conley estimated that the average yearly maintenance expenditures for residents in public institutions totaled $3,472 in 1968 and $4,635 in 1970. These figures were derived from direct accounting of expenditures. The annual figure increased approximately 33% by adding in the rental value of land, buildings, equipment; the value of unpaid resident work; and the value of volunteer labor. These adjusted annual maintenance expenditures for 1968 and 1970 totaled $4,546 and $5,865, respectively. Conley attributed the increase in per capita expenditures to the inclusion of capital costs which are usually excluded from cost studies and reports of public residential facilities.

Scheerenberger has conducted mail surveys of public residential facilities under the auspices of the National Association of Superintendents of Public Residential Facilities in 1974, 1976, 1977, and 1979. Financial data were collected on both the long and short form

questionnaires. The items on the long form included: total operating cost (personnel, other, depreciation), total new construction or major remodeling, and per diem. The short form asked for total operating cost (personnel, other) and per diem.

According to the trends reported by Scheerenberger (1978a) over one-half billion dollars was spent in maintaining public residential facilities in 1970. During 1976-1977 this figure had risen to almost $2.4 billion (p. 21). During the study conducted in 1979, 174 facilities completed the long form questionnaire and 104 facilities used the short form which determined only per diem. Scheerenberger (1979) estimated the total operational budgets were $3,033,907,945 excluding capital construction and renovation costs. The mean per diem was $60.10 for fiscal year 1978-1979 compared with the mean per diem of $44.23 for fiscal year 1976-1977 and $10.91 for fiscal year 1969-1970. During the past decade the per diem rate accelerated 451% in public residential facilities.

During the 1977-1978 fiscal year, Krantz, Bruininks, and Clumpner (1978) gathered per diem information for public residential facilities by surveying state government officials. The range of per diems varied from a low of $22.00 (est.) to a high of $116.05. The Southern states continued to provide lower per capita expenditures than other geographic regions. The national average per day per person cost was reported as $50.10 (p. 25).

Internationally, there have been two studies completed on the costs of institutions for mentally retarded people in Scotland and

Israel. Primrose (1972) assessed the differential costs of institutional care for different groups of residents in a 1,325 bed facility in Scotland. The purpose of the study was to illustrate the variation in cost which exists behind an "average per diem" figure. After classifying the patients by age and level of independence, per week cost-of-care figures were calculated for each group. The lowest cost was reported for adult males who worked off the grounds and lived in hostel arrangements on campus. The highest per week cost occurred for patients in the Admissions and Assessment Hospital Unit. The next most expensive cost of care was provided to people in the geriatric unit. The author concluded:

> Before valid comparisons of cost can be made, like must be compared with like; crude averages have little meaning unless details of what is included are known. (p. 626)

Don and Amir (1969) investigated the differences in cost between Israeli facilities operated by the government compared with large private facilities. Ten residential institutions constituted the sample (4 government operated, 2 public, and 4 private facilities). The cost of maintenance varied from $89.43 to $99.14 per month with higher costs paid in institutions providing care to more severely retarded residents. Government institutions tended to have higher staff-resident ratios, higher wage rates, but lower food costs. Expenditures on maintenance and repair varied with internal standards of care and budget flexibility rather than the physical condition of buildings or the space to resident ratio. No significant differences were found in expenditures due to heterogeneity of resident characteristics (sex, age, level of retardation).

The size of institutions did vary with costs, but in a curvilinear fashion. In government institutions, the average cost diminished up to 70-80 beds, then increased upward to 200 beds, then declined after 200 beds. Partial control for differences in characteristics of the population occurred in the selection of facilities by matching levels of resident functioning.

Ownership of facilities was also found to influence expenditures among the three types of facilities. Costs tended to be higher in government operated facilities because of "bureaucratic procedures and decision-making, regulations by the Civil Service Commission, strength of the union, and discouragement of thrift" (p. 38). While costs varied by the type of ownership, the level and quality of services did not. Don and Amir (1969) reported after careful personal observation that "the provision of services increased with the size of institutions, but the difference in quality of services tended to be small" (p. 39). A summary of the public residential facility cost studies appears in Table 2.2.

Community Residential Facility Cost Studies

Few significant studies have been undertaken in the area of community residential facility costs. Heal, Sigelman, and Switzky (1978) offered a detailed review of cost findings and reported that because of the poor quality of data O'Connor (1976) eliminated cost analyses from her reports.

Table 2.2

Summary of Public Residential Facility Cost Studies

Researcher(s)	Publication Date	Scope	Methodology Employed	Statistical Analysis	Study Period	Results	Limitations
Don & Amir	1969	Israel-4 government, 2 public and 2 private residential facilities	Onsite interviews and review of financial statements	Average monthly costs per patient were calculated for major categories such as personnel, programming, food, clothing, etc. Totals were presented by type of ownership.	1964-65	Monthly cost ranged from $89.43 - $99.14 with higher costs paid in institutions.	Descriptive totals only; analysis by ownership & size only.
Baumeister	1970	U.S.-public residential facilities from 1930-1965	Analysis of cost data collected by U.S. Census Bureau	Descriptive statistics such as annual per capita expenditure reported by year.	1930-65 by 5-yr. intervals	Year / per capita exp.: 1930 $ 265; 1935 252; 1940 291; 1945 386; 1950 746; 1955 1,093; 1960 1,660; 1965 2,375	Descriptive totals only.
Primrose	1972	Scotland-1 public residential facility	Onsite audit of cost records for one-week period	Average weekly costs were calculated for direct care, ward costs, general costs, and program costs. Figures are presented by type of resident (e.g., "Toddlers," "Active Boys," "Geriatrics")	1970	Lowest cost for adult males who worked off-campus. Highest costs per week for patients in Admissions and Assessment Units.	Descriptive totals only; analysis by type of resident.
Conley	1973	U.S.-public institutions	Analysis of Department of Health, Education, and Welfare data and U.S. Census Bureau reports	Calculation of direct and indirect costs of public institutions. Totals presented.	1968, 1970	$875 million public institution total; $1.1 billion public institution total.	Descriptive estimates for 1968 & 1970.
Scheerenberger	1978	U.S.-266 public residential facilities	Mail survey of all facilities; 223 reported financial information.	Total expenditures reported; proportions reported for personnel, capital, and general operating costs.	FY '76-'77	$2.4+ billion total; $44.23 per diem.	Descriptive totals only.
Krantz, Bruininks, & Clumpner	1978	U.S.-236 public residential facilities	Mail survey of state mental retardation coordinators	Average cost per diem reported by state and weighted proportionate to number of people represented.	FY '77-'78	$50.10 U.S. mean per diem.	Descriptive per diems only.
Scheerenberger	1979	U.S.-278 public residential facilities	Mail survey of all facilities; 174 long forms and 104 short form questionnaires completed.	Total expenditures reports; per diems and proportion for personnel, capital, & general operating costs.	FY '78-'79	$3.0+ billion total; $60.10 per diem	Descriptive totals only.

Several methodological problems hampered collection of cost information in the O'Connor study. First, no comprehensive system of accounting had been developed in group homes so that comparable fiscal information could be gathered. O'Connor attempted to gather cost data through a personal interview format. This approach failed because local accounting systems were not sophisticated enough to handle the questions; the interviewers and respondents were not accounting-oriented; and the interviewee was not often the most informed respondent about the financial aspects of the facility. To accommodate for these on-site problems, estimates were accepted during the interview and in other cases, local budget records were submitted and analyzed after the completed interview to assist in providing complete data on the protocols.

As previously mentioned, O'Connor made no statements about the costs of community residential care because of incomplete data. In replacement for the results, several excellent recommendations were presented to urge improved accounting procedures at the local level as well as the publication of an accounting manual (Sipe, 1976).

In 1973, Baker, Seltzer, and Seltzer collected annual budget figures from 196 community residences. The average annual budget for community facilities in 1973 was $56,000 or $4,680 per resident (1977, p. 205). In reporting the results, Baker et al. presented annual per capita expenditures by prototypic models or types of residential programs. The models were defined by size, type of resident served, or specialized services. Small group homes serving 6-10 residents reported

a per capita budget of $5,690 which was almost twice as expensive as a large group home (21-40 residents) with an annual expenditure of $3,380. During that same year, the per diem in public residential facilities was $24.43 or $8,917 per year per resident (Baker et al., 1977).

Heal et al. (1978) cautioned that comparisons of per diem figures between public and community residential facilities proposed by Baker et al. (1977) were dangerous. Public residential facilities do not include capital costs of land and buildings in the per diem figures. The cost of rent, on the other hand, was included in the cost estimates provided by community residential facility administrators. Program and service costs, however, were included in the public residential facility per diem, but were excluded from the community residential facility per diem.

Disparity in public and community residential facility data emerges from two other sources: a) differences in the characteristics of the population served, and b) the effect of population decline within public residential facilities on fixed costs. In recent national surveys of community and public residential facilities (Bruininks, Hauber, & Kudla, 1980; Scheerenberger, 1978a), the population served in public residential facilities was primarily residents with severe or profound levels of mental retardation (75%). This figure contrasts with 32% of the population in community residential facilities with the same classification. The degree of dependence of residents significantly contributes to the differences of cost. The second problem

relates to the rapid decline in number of residents in public residential facilities. This flux of numbers causes an acceleration of fixed costs that cannot be reduced quickly. Certain fixed costs such as administrative overhead and maintenance of buildings cannot fluctuate with changes in resident attendance. Thus, as the population declines, the volume of resident days decreases which drives up unit costs.

Peat, Marwick, Mitchell & Co. (1976) was commissioned by the Illinois Developmental Disabilities Advisory Council to estimate the cost of designing and operating ten various residential service arrangements. The costs included start-up financing, operating expenses, and the capital financial requirements for establishing normalized residential service facilities.

One of the most important assumptions of this report was that community residential facilities typically underpay professional and paraprofessional staff. If competitive rates of pay similar to public residential facilities were paid by community residential facilities, the average daily cost was estimated to be in the range of $26.08 to $41.98. This per diem range included capital costs and was comparable to the range of per diems in public residential facilities at the time of the report in 1976.

Peat, Marwick, Mitchell & Co. also found that there was a generally predictable relationship in human service organizations between personnel and other direct operating costs. The relationship varied depending upon the size of facilities and composition of services, but generally, over a long time period with a large number

of providers, the salary mix of staff personnel in each arrangement tended toward the overall mean salary for each position. If salaries showed wide variability, it was a result of educational qualifications, experience, or the supply and demand of the local labor market for qualified personnel.

On a smaller scale, the Department of Mental Health in Indiana (1975) produced a progress report on ten community residential facilities at the request of the Indiana Legislative Council. Lower costs were associated with units offering the least services and the highest functioning residents. Differences within apartment units depended on resident characteristics such as functioning level and independent living skills. Differences within larger group homes were affected by rent or mortgage payments with lower rates reflecting gratis or donated buildings and furnishings. Those facilities which served younger, severely handicapped children experienced higher costs. Personnel expenses consumed the largest share of the budgets ranging in proportion from 32% to 73% of total operating costs. The average cost of personnel for all ten agencies totaled 53.2% of the budgets.

Heal and Daniels (1978) completed a cost effectiveness analysis of three community alternatives (natural homes, supervised apartments, and group homes) in three counties in northern Wisconsin. Personal interviews were conducted with a representative sample of 29 developmentally disabled individuals and their residential supervisors to collect data about the individuals and the facility. The major purpose of the study

was to identify and measure six major dimensions: a) competence, b) social adjustment, c) normalized life style, d) satisfaction, and e) economy. There were two sources of costs, those borne by the individual resident and those paid by society. Apartments were found to have the lowest society cost, the highest individual contribution, and the highest approximation to a normalized life style. On the other hand, the group homes were more expensive for society and were less normalized than apartments. Natural homes were found to be at intermediate levels between these two types of residences. Table 2.3 presents the results of this study.

Table 2.3

Means, Standard Deviations, and Number of Cases for Three Residential Alternatives[a]

	Individual Cost		Society Cost		Total Cost
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$
Group Home (n = 16)	$1,564.25	399.65	$5,361.00	112.53	$6,925.25
Natural Home (n = 9)	1,423,22	1,417.45	4,576.33	1,751.94	5,999.55
Apartment (n = 4)	3,645.00	1,617.92	1,833.75	1,174.05	5,478.75

[a]Heal and Daniels, 1978, p. 3a.

As noted earlier in this section, O'Connor was unable to publish cost data from the interview study of 105 facilities conducted in 1973. Based on that experience, O'Connor and Morris (1978) designed a study with specific emphasis on a specially designed accounting system that

would record accurate cost information for a 12-18 month period. The second purpose of the study was to analyze costs with facility and resident characteristics (facility location, administrative structure, size of facility, and age of residents).

Of the 200 community residential facilities in HEW Regions IX and X, 50 facilities volunteered to participate. No selection was made although certain strata were identified such as profit/nonprofit ownership, size, age of residents, and location. A four-month pilot study was conducted with eight facilities to test the accounting system. Following minor changes in the forms, four workshops were conducted throughout those regions to give training to 50 facility administrators. Follow-up workshops were conducted two months later. The final sample size was 29 facilities located in four states: Washington (n=8), Oregon (n=10), California (n=8), and Arizona (n=3). Of the 29 facilities, 9 were proprietary, and 20 were nonprofit organizations. The average size was 24 residents, and the average age of the residents was 25 years.

The results were reported as average monthly expenses per resident by type of operating costs. Relationships were analyzed by correlation, one-way analysis of variance tests, and stepwise multiple regressions. Table 2.4 presents the mean costs per month per resident by type of operating cost and capital cost. The per diem was $12.80 per person for operating costs and $2.27 per person for capital costs.

Ten variables were selected and one-way analyses of variances were completed with four dependent variables--staff costs, total operating

Table 2.4

Summary of Generic Operating Costs and Capital Costs by Resident per Month[a]

Type of Cost	Mean	SD
Staff	$262	$195
Food	47	13
Utilities	19	11
Insurance	4	4
Repair and Maintenance	10	7
Taxes, Licenses, Fees	4	4
Supplies	13	11
Vehicles	14	11
Miscellaneous	11	15
Total Operating Costs	$384	$226
Total Capital Costs	$ 68	$ 46

[a]O'Connor and Morris, 1978, p. 28.

costs, capital costs, and total costs. According to O'Connor and Morris:

> Five variables were significantly related to all four costs including state, region, degree of programming, staff to resident ratio, and age of residents. A sixth variable, profit orientation was related to all but the capital costs. Two variables, type of dwelling and size of facility, were significantly related only to capital costs. (p. 44)

The only variables that were not related to costs of CRFs were facility isolation and resident IQ.

The final level of analysis was a stepwise multiple regression to ascertain the predictive combinations of variables. Results indicated:

> There were probably three underlying factors in the data. The first factor which was related to both

> operating costs and total costs, was a combination of staff to resident ratio, degree of programming, and age of residents. The second factor which was related to all three costs, was the type of dwelling. The third factor appears to be the state in which the facility was located. (p. 58)

In discussing the results O'Connor and Morris cited staff to resident ratio as a major factor contributing to personnel costs and in turn, expenses consuming the majority of community residential facility budgets. The level of programming is related to both staff to resident ratio and personnel expenses. Nonprofit facilities tended to have higher staff to resident ratios and levels of programming. Size was related to capital costs with the larger facilities reporting higher capital costs.

Gross (1978) analyzed existing cost data from community residential studies in Massachusetts and Virginia using five different cost reporting methods. This study was the first attempt to describe and categorize cost reporting techniques applicable to social welfare literature.

Cost reports can vary in response to three basic questions:

1. Cost to whom?

    a) resident
    b) families
    c) service agency
    d) federal government
    e) society

2. What is the object of the cost study?

    a) individual
    b) agency
    c) government level

3. What is the method of determining costs?

a) Reimbursable cost reporting coined by Gross to mean determination of the level of cost sharing by a specific government unit. After total cost is determined for the program under study, all other contributions are subtracted from this amount leaving the reimbursement level of the specific government unit. Mayeda and Wai (1975) attempted to report the share of financial participation as money flowed from the federal government down. This method has not been fully developed.

b) Average per person cost reporting, according to Gross, is widely accepted because readers can readily grasp the meaning of the measure. The problem with this approach is the inherent weakness in averaging across all individuals. The objective of this type of analysis is to determine the total costs of a program to the government and the total number of people served.

c) Functional cost reporting is an accepted term in the literature that means an internal method that separates costs into direct program costs (variable costs) and support service costs (fixed costs). Beatrice (1974) divided residential costs of Massachusetts into these two categories in order to project the effect of rapid deinstitutionalization (volume change) on cost over time.

d) Unit cost reporting is also found in the literature and means calculation of the cost for one unit of service by dividing the total costs for a service by the total number of service units. The difficulties of this approach have been thoroughly expounded by

Bowers and Bowers (1976) and include:

> (a) lack of service objectives, (b) poor service definitions, (c) no common language of services, (d) poor unit definitions, (e) lack of data, (f) no public pricing of services, (g) the unique nature and composition of human services, (h) lack of project continuity in experimental efforts, (i) the apprehension of workers that units of service will be linked to worker efficiency, (j) lack of system designers who understand the whole of the unit of service system, (k) a lack of support systems in place, and (l) a lack of information use by management. (pp. 11-28)

e) Needs approach of cost reporting is a recent development which has no theories and no studies to support its use. The method begins with a diagnostic procedure of individual resident needs followed by a prescription of services to meet those needs including timeline and the appropriate number of units of service. Costs are then calculated for the prescription according to the type of provider. Anderson, Greenberg, Patten, and Fine (1976) have selected 200 elderly residents in nursing homes and matched them with 200 elderly people who live in their own homes. No results have been yet reported.

After reviewing the contradictory results of four cost studies on residential services (Rathbone-McCuan et al., 1975; Jones & Jones, 1976; Mayeda & Wai, 1975; Beatrice, 1974), Gross argued that the inconclusive findings may be a result of differences in cost reporting methods. By applying the five cost reporting methods to two sets of data from the Commonwealth of Virginia alternative living environments for the elderly and the Commonwealth of Massachusetts alternative living environments for the mentally retarded, Gross found that outcome varied with type of approach used.

Of the five methods, Gross (1978) found:

> There is no one way to calculate costs for such analysis . . . without full knowledge of the methodological and behavioral implications of each cost reporting approach, they are all potentially susceptible to misuse. (p. 38)

The deinstitutionalization movement does not singularly affect people who are mentally retarded. Persons who are chemically dependent, mentally ill, or juvenile delinquents have also been served in a wide array of community residential alternatives. Faced with a similar gap in the lack of centralized planning and development of community options, little is known about operating costs, characteristics, and effectiveness of halfway houses of psychosocially disabled persons. The National Institute of Mental Health recently sponsored a study to determine the costs associated with the provision of community based residential care. The purpose of this study was to examine the differences in costs as they relate to characteristics of disability groups, the type of facilities, and the types of services provided by the facilities.

One of the first problems encountered by investigators Piasecki, Pittinger, and Rutman (1977) was the absence of a meaningful classification framework:

> Designations such as boarding home, board and care facility, group home, hostel, or domiciliary care facility tend to be used somewhat interchangeably by different authorities to describe essentially the same type of residential service. The same problems can be observed with respect to varying descriptive terms for halfway house type programs, e.g., halfway house, sheltered living home, transitional home, rehabilitation house, as well as for various apartment-dwelling types of programs. (p. 2)

Given this kaleidoscope of overlapping descriptions, a typology was formed using size, type of staff, and scope of services. A second broader framework comprised of three sets of variables for statistical analysis was also designed. The factors were environment (geographical location), organizational attributes (staffing patterns and services), and client group characteristics (age and level of disability).

Per diem costs varied substantially according to the locale of the residence. Facilities in urban downtown areas reported average daily costs for 1973 at $11.20 while facilities in rural areas reported costs of over $18.00 per day. Facility costs also varied widely by geographic region. Nursing home costs were lowest in the South ($13.51) and highest in the Northeast ($21.43).

Organizational variables, particularly the total expenditure for staff salaries, was an important determinant of total per diem cost for residential services. In halfway houses, about 50% of the average facility budget was expended on salaries. The presence of full-time professional staff was also an important factor in determining the overall costs of the program. Facilities which made extensive use of volunteers and paraprofessionals were significantly less expensive than those employing full-time psychologists and psychiatrists.

The rank ordering of per diems by type of ownership revealed that proprietary operations cost less than $9.00 daily, nonprofit organizations operated at a cost of slightly over $9.00, while government facilities were most expensive with per diem rates over $12.00. Generally, facilities operated by governmental units tended to report

the highest cost per day, the lowest number of residents per unit, and the lowest occupancy rate.

Facilities offering basic domiciliary services were found to be less expensive than those offering educational, vocational, or counseling services with the former costing $9.97 and the latter averaging $11.36.

A brief synopsis of the community residential facility studies is presented in Table 2.5. The National Institute of Mental Health study completed by Piasecki, Pittinger, and Rutman (1977) was excluded because the residents were not mentally retarded. The study by Gross (1978) was excluded because the purpose of the research was methodological in nature.

Comparison Cost Studies of Public and Community Residential Facilities

One of the most carefully designed studies of comparison between community and public facilities was conducted by Mayeda and Wai (1975). The model they employed aggregated costs over six direct variables and one indirect cost variable including: a) room and board, b) attendant services, c) special programs, d) special professional services, e) educational programs, f) support services, and g) general and administrative costs. By analyzing budgets of state hospitals and regional centers in California, Florida, and Washington for a six-month period in 1974 and 1975, Mayeda and Wai were able to trace and record the total costs for services provided to 4,284 community and institutional residents.

Table 2.5

Summary of Community Residential Facility Cost Studies

Researcher(s)	Publication Date	Scope	Methodology Employed	Statistical Analysis	Study Period	Results	Limitations
O'Connor	1976	U.S.-Sampling frame of 3,412 community facilities; 105 selected for interviews	Interviews were conducted of facility administrators	None	1973	None	No report because of incomplete data
Baker, Seltzer, & Seltzer	1977	U.S.-Sampling frame of 381 community facilities	Mail survey of 196 facilities; in-depth interview in 15 facilities located in Northeastern U.S.	Per diems presented by type of facility. Researchers defined the "types."	1973	Average annual budget was $4,680 per resident in 1974. ($12.82 per diem)	
Indiana Department of Mental Health	1975	Indiana-10 community facilities	Analysis of cost reports submitted to Indiana Department of Mental Health	Costs broken down by major categories such as personnel, food, capital expenditures. Ranges of per diems given by type of facility.	1975	Lowest costs associated with least services and highest functioning residents. Average per diem was $15.40.	Provides per diem for small (n=10) sample of homes.
Peat, Marwick, Mitchell, & Co.	1976	Illinois-estimation of fiscal requirements to develop normalized residential services.	Analysis of cost reports from other states and site visits to Minnesota, Nebraska, Pennsylvania, & Michigan.	Estimation of per day costs presented by level of occupancy. Capital costs estimated for renting, buying and building. Pro forma expenses presented for each type of facility.	1976	Estimated per diems ranged from $26.08 - $41.98.	
Neal & Daniels	1978	Wisconsin-29 individuals in 3 settings (natural home, group home, apt.)	Personal interviews with 29 developmentally disabled individuals and their residential supervisors.	Estimates of individual resident contributions to cost of care (labor and money) and society's contribution to cost of residential service for sample of 29 residents.	1977	Apartments ($5,478.75) were the most cost effective alternative when compared with group homes ($6,925.25) and natural homes ($5,999.55).	
O'Connor & Morris	1978	Region IX and X-29 facilities in Washington, Oregon, California, and Arizona	Facilities were trained and asked to submit standard monthly report of expenses and revenues for 1 year. Site visits by research staff to collect resident, building, and personal data.	Results reported by operating costs, capital costs, relationships of facility and resident characteristics to cost, and revenues. Use of multiple regression to determine relationships.	1975	Average total operating program costs were $384.00 @ month per person ($12.80 per diem). Average capital cost per person per month was $68.00 ($2.27 per diem). Three combinations of variables contributed to cost differences: (1) staffing/programming/age of residents, (2) type of dwelling, and (3) state.	

In addition to the collection of cost data, a performance measure of resident adaptive behavior was taken with one of three scales: the Adaptive Behavior Scale, the Washington Assessment and Training Scale, and the Florida Client Assessment Instrument. Mayeda and Wai planned to link individual progress with expenditures as a means of approximating cost-benefit relationships. The last objective of this study was to study the "input/output funding flow structure in two community-based systems" (p. 2).

The cost data of the Inland Counties Regional Center in California were analyzed in combination with the input/output studies and the assessment data of individual clients. Although this Center is responsible for purchase or provision of services to developmentally disabled clients, there was "an expenditure bias toward children living at home with natural parents" and evidence to indicate that "many clients were not being provided with certain professional services" (p. 4). The first conclusion of this study was:

> The cost of services to developmentally disabled persons in state hospitals do not differ significantly from the adjusted true costs of services in community settings provided both groups are provided with a full array of needed services. (p. 4)

During the six-month period of this study, the mean cost of services to residents in state hospitals was $6,247 compared with $638 for clients in the community. When the additional costs of educational programs, special professional services, and generic services were added, the true cost of services in community settings approached the costs of care in state hospitals. The original difference between the

two settings ($6,247 and $638) was explained as a function of utilization patterns since none of the 463 clients served through the Inland Counties Regional Center received dental, psychological, speech, audiology, occupational therapy, physical therapy, or any other special professional services during that six-month study period. The authors concluded:

> The service utilization patterns in community settings are lower than utilization patterns of services in state hospitals due partially to the weaknesses of the coordinating interface in community settings and differences in repayment criteria and policies. (p. 5)

It should be mentioned that not all clients needed these professional services, while in some instances those who did need services received them in community residential or day programs rather than the Inland Counties Regional Center. Mayeda and Wai redefined the difference between state hospitals and community programs as a difference in organizational administrative structures. A state hospital was a unified service system administered by a single person or unit and was demand dominated whereas community programs were multiply administered and supply dominated.

Developmentally disabled individuals who lived at home with their parents cost society less than placement in group homes and significantly less than placement in state hospitals. The Inland Counties Regional Center reported providing liberal services to parents to help maintain children in homes. This finding led to the third conclusion by Mayeda and Wai:

> The major actual cost savings for services to developmentally disabled persons who actively require nurturance

> and assistance are rooted in the natural home environment. The cost of liberal home support and special professional services to those living at home will not deplete these savings. (p. 8)

Jones and Jones (1976) collected budget information on 13 community residential facilities in Massachusetts as part of a larger study of community placement of discharged residents. Cost savings did accrue when residents were placed in the community, particularly to the state since the financial burden was shifted to federal, local, and private sources of funding.

Cost data were collected on a small sample of 24 residents which was considered representative of the larger population. Between January 1, 1972 and June 30, 1973 individual records were kept in terms of Supplemental Security Income, costs to the Massachusetts Department of Mental Health, in-kind services provided, and resources coming from private agencies for the sample. A comparison was made with institutional costs if the sample residents had not been released. Jones and Jones found:

> The average cost in the institution is $7,464 versus $6,112 in community residences. However, when the costs of rehabilitative programs and federal input are added, the difference narrows markedly. (p. 87)

Jones and Jones also examined some of the same issues addressed by Mayeda and Wai. They questioned whether cost comparison of services provided in state hospitals and community settings could be made without controlling for the needs of residents and the actual services delivered to residents. In terms of differences in service utilization patterns between unified systems such as state hospitals and coordinated

systems such as community programs, Jones and Jones proposed that other factors beside administrative variables should be examined. Utilization may be in response to need, awareness of need, availability of subsidization, and any combination of these factors. Based upon observation and personal judgment, the authors concluded:

> The institution, as a treatment site for the developmentally disabled, does not come out as very desirable on either a cost or an effectiveness criterion and certainly not on an effectiveness to cost ratio. (p. 18)

In the Commonwealth of Virginia, Murphy and Datel (1976) undertook a cost-benefit analysis to project costs and benefits over a ten-year period for 52 clients transferred from institutions to community settings. Clients were stratified by housing, employability, and source of income. Costs were entered for community support services, client maintenance, service integration, deinstitutionalization, and lost economic productivity. Benefit elements included savings of institutional costs and increased economic productivity. The ratios of benefits to costs for all but one strata ranged from 1.52 to 11.86. The only stratum for which costs exceeded benefits were those clients who needed intensive care, were not employable, and received at least half of their income from public sources. In this stratum, the average net cost per client for the 10-year period was $395.93. The average net benefits per client ranged from $2,500 over 10 years for residents in nursing homes to $29,000 over 10 years for clients who are employable full-time. The authors noted that savings in deinstitutionalization benefit state sources. On the societal cost side, federal sources carry much of the load in maintaining deinstitutionalized residents.

Most recently, Intagliata, Willer, and Cooley (1979) completed a cost comparison study of institutional and community based alternatives for mentally retarded people in New York. The purpose of this study was to analyze and compare costs for residential care separate from professional services in both public and community settings. The sample consisted of a public residential facility (1,400 residents); a hospital based rehabilitation unit for children; a county Association for Retarded Citizens agency providing residential services, school services, and sheltered workshop services; and a Board of Cooperative Education Services Center providing special education services.

Several problems were encountered with the quality of cost data. First, there were no consistent standard units of service defined or applied in the cost records of the sample. Second, budgets were prepared according to conventional line items rather than functional lines using services as cost centers. Last, there was little or no cross referencing of cost data with resident characteristics. For example, 76% of the public residential facility population was severely retarded, but the facility could not determine how many of those residents received a particular service such as physical therapy and at what cost. This last limitation was projected by the authors to have even greater importance in the future since "subpopulation analyses will become increasingly relevant as the population of individuals being released from institutions becomes more diverse" (p. 12).

Given these limitations, Intagliata et al. (1979) found that the annual per capita costs of natural family ($2,108) and family care

($3,130) settings were significantly less expensive than the institution ($14,630). However, the annual per capita cost of residential care provided by group homes ($9,255-$11,000) was significantly greater than that of other community settings examined, and in fact, depending upon resident level of disability, approached the cost level of the public residential facilities.

In response to a need for nationwide data on capital outlays for public and community residential facilities, the President's Committee on Mental Retardation commissioned the National Association of State Mental Retardation Program Directors, Inc. (NASMRPD) to conduct a state-by-state survey in 1978-1979. The major purpose of this study was to determine:

> to what extent are the states, the traditional providers of residential services to mentally retarded citizens, using capital construction dollars to reconstruct and expand existing public institutions, as opposed to enhancing the development of community residential programs. In other words, are we seeing the recent trend toward community based residential facilities undermined by widespread efforts to rebuild existing institutions. (p. 2)

The staff at NASMRPD completed the survey in three phases between December, 1978 and July, 1979. The first phase consisted of phone interviews to each state to determine the best respondent who could handle questions related to capital budgeting. Copies of state capital budget plans were solicited from all states and received from 39 respondents. In February, 1979, the second phase of the study began with analysis of budget materials sent by states. This analysis led to the drafting of a pilot interview form. The questionnaire was

finalized and sent in advance of the phone interview. During the third phase, phone interviews were conducted between March and July, 1979. Verification of answers occurred by mail follow up.

Because of varying definitions, approaches to budgeting, and time frames employed by individual states, comparisons of capital improvement projects on a state-by-state basis were very difficult to complete. At a national level, capital outlays were reported for fiscal year 1977-1978, fiscal year 1978-1979, and fiscal year 1979-1980. The actual and projected state appropriations for capital projects totaled $1 billion for this three-year period. Five states (California, Michigan, New Jersey, New York, Ohio) accounted for 52% of the total outlays during that period.

The predominant type of project funded was construction or renovation projects on the grounds of state-operated residential facilities which accounted for 82.7% of the appropriations. In 33 of 50 states, the entire capital improvement budget was earmarked for state institution renovation projects. The primary reason cited by respondents for capital improvements in state institutions was the need to comply with federal Intermediate Care Facility/Mental Retardation (ICF-MR) standards. Failure to comply with ICF-MR standards would cost $758.8 million in federal money, according to 35 state respondents.

No states reported plans to build new public residential facilities or to increase total bed capacity of public residential facilities. States did plan, however, to construct community day program buildings (8) and community residential facilities (13).

The per capita outlays for public residential facility renovations (based on relative number of residents in PRFs) ranged from a high of $24,205 in Washington to a low of $404 in Rhode Island. The national median was $5,460.

A summary of the comparative cost studies of community and public residential facilities is presented in Table 2.6.

Cost Functions of Human Services

The application of statistical techniques to cost data in order to estimate economic relationships and to test various hypotheses about such relationships was defined by Johnston (1960) as statistical cost analysis. Pure relationships in statistical cost analysis are rarely assumed. This approach recognizes that cost fluctuations may be a function of the size of the organization, the labor intensity of the operation, and the general level of wages. The statistical testing of economic hypotheses was characterized as both complex and hazardous by Johnston (1960) since:

> The economic system grinds out its complex convolutions; the myriads of actors--consumers, firms, regulatory agencies, and government units--act and interact; a more or less imperfect collection of statistical agencies records, with varying degrees of error and omissions, partial, quantitative measures of this evolutionary economic process; and the poor econometrician comes along in the wake of the monster, gathering what data he can in an attempt to "test" various hypotheses about aspects of economic activity. (p. 2)

The paucity of published statistical cost analysis studies in the area of residential facilities for mentally retarded residents may, thus, be attributed to the lack of systematic data collection approaches,

Table 2.6

Summary of Community and Public Residential Facility Cost Studies

Researcher(s)	Date	Scope	Methodology Employed	Statistical Analysis	Study Period	Results	Limitations
Mayeda & Mai	1975	3 states-1 public residential facility in Washington, 2 public facilities in Florida and community facilities in California & Florida.	Expenditure data for 4,284 residents were collected in five major categories for a six-month period.	Totals & means were presented for the breakdown of costs at each location. Chi-square tests and analysis of variance computed for California data.	1974-75	Mean cost of services to residents in state hospitals was $6,247 compared with $638 for community facilities. Difference was explained in terms of utilization patterns.	In-depth analysis of costs by demographics of residents (age, sex, handicap) and utilization of services. No analysis by organizational factors.
Jones & Jones	1976	Massachusetts-13 of 16 community facilities participated. Costs based on 24 discharged residents.	Detailed budgets were analyzed; information was obtained from parent/housepparent interviews and Dept. of Mental Health reports.	Means & ranges reported for breakdown of facility costs & sources of revenue; individual resident profiles are given including sources of support. Cost differences reported by place of residence (community or public).	1972-73	Average cost in institution = $7,464 Average cost in community = $6,112	Small sample prohibited cost analysis by resident characteristics and facility characteristics. Excluded organizational factors that influence cost variation.
Murphy & Datel	1976	Virginia-52 residents who were discharged from institutions	Projected costs & benefits for the sample of residents were estimated. Seven adjustments were made.	Average & total cost-benefit ratios were presented for total sample.	Projection based on 1973-74 data	$20,800 per capita savings over 10-year period by placing residents in community.	Small sample size; projections based on limited study period. No identification of critical factors that affect cost.
Intagliata, Miller, & Cooley	1979	New York-1 public residential facility, 1 hospital rehab unit, 1 special school center, 1 ARC system	Budget documents were obtained & analyzed. Foster home costs were obtained from state billings.	Average cost per resident per year presented for each type of facility. Day program costs reported separately.	1977-78	Institution = $14,630 annual per capita. Group home = $9,255-$11,000 annual per capita. Family care = $3,130 annual per capita Natural family = $2,108 annual per capita	No analysis by resident characteristics or organizational factors.
National Association of State Mental Retardation Program Directors	1980	U.S.-state by state survey of capital outlays for PRFs & CRFs	Phone interviews with state government officials. Analysis of state capital budgets & plans.	Analysis by state totals. National totals given for 3-year period FY'77-'78, FY'78-'79, & FY '79-'80	1978-79	Total state appropriations for capital projects totaled $1 billion for 3-yr period. National median outlay was $5,460 per person for public residential facility renovations.	

failure to identify and measure organizational factors concurrently with the expenditure data, widely different accounting practices, and failure to select statistical techniques that test both linear and curvilinear relationships. O'Connor and Morris (1978) are the only researchers who have attempted a cost function analysis of residential facilities for mentally retarded people.

Cost function analysis studies have been reported in education, nursing homes, and hospitals. Turning away from the studies of residential services for mentally retarded people to these other areas of human services, a brief overview will be given of the issues, methodological concerns, and results of cost function analysis.

According to Knapp (1978) a statistical cost function is the:

> empirical representation of the relationship between the cost of production and the level of output, usually obtained from a multiple regression of total or average cost (cost per unit of output) upon output and other significant influences such as the mix of output and idiosyncracies of particular producing units. (p. 31)

In the case of residential care, one would like to know how the costs of care vary with the size of the home, the dependency of residents, and the changes in resident well-being and behavior. Size and resident characteristics are considered inputs or the independent variables. In contrast with industry, which can quantify raw material inputs such as tons of metal needed for manufacturing, human services identify and measure inputs with less precision, often using proxies to substitute for real inputs. The dependent variable is cost per unit of output.

Educational Production Function Studies

Cohn (1979) identified several factors (proxies) that have been used as inputs in cost production studies of schools. The three broad categories are 1) student characteristics, 2) school related factors that can or cannot be manipulated by administrators, and 3) community influences. Student characteristics, according to Cohn are the "innate endowment variables of individuals." These variables are usually omitted in studies because of the lack of a reliable measure. School factors include a) building characteristics and condition of physical plant, b) quantity and quality of equipment, c) support facilities such as library, d) size of school, e) curriculum, f) class size, g) extra curricular offerings, h) teacher experience and training, i) teaching load, j) teacher salaries, k) administrative characteristics, and l) auxiliary staff. The community influences include a) parent socioeconomic status, b) community attitudes, c) average income, d) degree of urbanization, and e) peer influence.

The initial studies in education began at a micro-level of analysis usually at the district level. One measure of output was correlated with several identified factors. Mollenkopf and Melville (1956) found a positive correlation between library and supply expenditures and student achievement scores. Other single factors that had some degree of positive correlation were student/teacher ratio, class size, and number of special support personnel. In 1962 Thomas used regression techniques to identify three variables that were related to student performance: starting salaries, teacher experience, and number

of books in the library. Coleman (1966) published a landmark study identifying several "nonschool factors" that affected achievement in addition to the single school factor, teachers' verbal ability. Because of the controversial nature of its findings, the statistical analysis of the data has been criticized. Of particular importance for this study was the selection and entering of variables in the regression equation.

Cohn noted that stepwise multiple regression assumes independence of variables. If multicollinearity is present then the first variables entered will be most potent. Coleman entered nonschool factors first and those variables had the greatest importance.

Of the several variables that have been studied in schools, Heim (1972) reviewed the literature and found five variables that were consistently studied: 1) teacher degree status, 2) teacher experience, 3) interaction of inputs and outputs, 4) class size, and 5) availability of special support staff.

Education Cost Function Studies

The results of education production function studies may be applied pragmatically to the issue of estimating optimal school unit size in order to maximize outputs and minimize cost. Although both the theoretical and empirical foundations of such work need greater refinement, policy makers have relied upon cost function outcomes in making decisions about school consolidation. The impetus to minimize school costs through reallocation of resources is most keenly

experienced during difficult economic periods. As Cohn and Morgan (1978) explained:

> As long as the economy was growing at a relatively rapid pace, along with growing K-12 enrollments, funds for the operation of public schools were relatively plentiful. In an age of plenty, coupled with growth, administrators are frequently more interested in expansion and development than in relallocation of resources to reduce costs. That era is no longer here, replaced by stagnation--even reduction--in enrollments, along with increased competition from higher education and other public services for the taxpayers' dollar. It seems that now should be an especially opportune time to concentrate on the allocation-of-resources topic, since it appears that improved resource allocation may be the only option which administrators may employ to improve the educational outputs. (p. 89)

Abundant literature on school economy of scale shows a U-shaped relationship between size and per pupil expenditures. In other words, high per pupil costs are usually associated with both small and large school units with minimal costs for those schools in between. The optimal school size has varied from state to state as shown in Table 2.7.

Table 2.7

Summary of Selected Education Cost Function Studies

Researcher	Year	Sample	Size[a]
Riew	1966	Wisconsin High Schools	1,675
Cohn	1968	Iowa High Schools	1,500
Osburn	1970	Missouri High Schools	2,244
Sabulao & Hickrod	1975	Illinois Unit Districts (K-12)	2,432
		Illinois High Schools	874
		Illinois Elementary Schools	336

[a]Average daily attendance

An underlying assumption of past cost function studies was that a school district, school, or school building was a proper unit of observation for determining scale effects regardless of the mix of programs offered. The study conducted by Sabulao and Hickrod (1975) investigated the differential effects of three types of school units, and they concluded that greater economies of scale existed for unit districts that operated K-12 grades in contrast with districts operating K-8 grades or 9-12 grades only.

In addition to size, Cohn and Hu (1973) examined the mix of programs within Michigan schools and they found the annual costs of vocational programs was $100 greater than nonvocational programs. Further analysis of program costs indicated wide variation in enrollment, student teacher ratios, and teacher salaries within a school unit. They concluded:

> School consolidation may not serve to reduce per pupil costs unless enrollments increase in programs for which scale economies apply. Reallocation of students among programs within a given school may achieve greater economies than would be obtained from consolidation of two or more schools. (p. 312)

It appears that savings accrue to organizations whose administrators can analyze, combine, and reorganize services which are subject to economy of scale within a school or district. This application of cost function analysis to resource allocation in districts and classrooms has been examined by Thomas (1980), Michelson (1972), and Cohn and Morgan (1978).

The definition of quality educational services remains elusive to several researchers in the area of cost function analysis. Cohn

(1975) noted that a comprehensive index of school output remains inadequate particularly the measurement of the quality of services. There has been little attempt to measure the unintended consequences to student achievement after school size increases. Alkin and Benson (1968) found no increase in math and reading achievement results associated with increased size after the socioeconomic status of students and expenditure per pupil had been allowed to operate. Kiesling (1968) examined size, output, and results from several achievement tests. When the socioeconomic background of students and the expenditure per pupil were allowed to operate, the shape of the function was linear and negative. Larger schools were associated with lower achievement test scores. James and Levin (1970) cautioned against further conclusions about scale and outputs given the inadequate information on the shape of the function.

Hospital Cost Function Literature

In no human services area has there been greater productivity in cost function analysis than hospitals. The introduction of Medicare in the United States in 1966, has had "tremendous impact on total expenditures, allocation of new resources to the health sector, and caused acceleration of prices of health services, especially health care" (Friedman, 1973, p. 234). Of crucial concern to health care researchers is the relationship of public policy on supply, demand, and pricing of health care services. Cost studies have examined such questions as the optimum size of hospitals (economy of scale) for

building new facilities as well as examining efficient use of existing hospital resources.

One of the first considerations in designing hospital cost studies is the definition of hospital output. Although a hospital has numerous outputs, most researchers use simple dependent measures such as patient days or average daily census as an output measure. Table 2.8 briefly summarizes some recent hospital cost function studies.

A secondary issue addressed by researchers in several different approaches is the definition of case mix. As shown in Table 2.8, researchers have:

1) assumed that case mix is reasonably constant within a single hospital over a short time period (Lave & Lave, 1970; Carr & Feldstein, 1967; Ingbar & Taylor, 1968);
2) stratified hospitals into groups on the basis of facilities available to provide care. Grouping occurs on the basis of number and type of facilities (Berry, 1967a, 1970; Francisco, 1970; Kuenne, 1972; Berry & Carr, 1973);
3) estimated cost relationships for each of several hospital departments assuming the case mix within a department is homogeneous (Carr & Feldstein, 1967; Francisco, 1970; M. Feldstein, 1968; Ingbar & Taylor, 1968; Kuenne, 1972);
4) developed a composite output measure by using a set of derived weights for various services. The total output of each hospital is a weighted sum of individual services (Cohen, 1970);

Table 2.8

Summary of Hospital Cost Function Studies

Study	Year	Interval Observation	Type of Hospital	Sample Size	Output Measure	Definition of Case Mix
Berry & Carr	1973	1966	Short-term, general-all hospitals (AHA Annual National Survey)	2700	Average daily census	Stratified hospitals into groups on the basis of numbers and types of facilities.
Berry & Carr	1973	1966	Short-term, general-governmental (AHA Annual National Survey)	667**	Average daily census	Stratified hospitals into groups on the basis of numbers and types of facilities.
Berry & Carr	1973	1966	Short-term, general-voluntary (AHA)	1772**	Average daily census	Stratified hospitals into groups on the basis of numbers and types of facilities.
Berry & Carr	1973	1966	Short-term, general-proprietary (AHA)	154**	Average daily census	Stratified hospitals into groups on the basis of numbers and types of facilities.
Kuenne	1972	1964-19[illegible]	General hospitals in New Jersey with 4000-7000 annual admissions	25	Admissions	Stratified hospitals into groups on the basis of numbers and types of facilities. Also assumed case mix within a department is homogeneous.
Kuenne	1972	1964-1970	General hospitals in New Jersey with 7000-13,000 annual admissions.	24	Admissions	
Lave, Lave, & Silverman	1972	Second half of 1968	General hospitals, Western Pennsylvania	65	Utilization (actual bed days/available bed days)	Cluster analysis of diagnostic categories for purposive aggregation of services.
Evans & Walker	1972	1967	General hospitals, British Columbia	90	Average occupancy rate (100 X total patient days/365/total available beds)	Factor analyzed diagnostic categories into homogeneous output variables.
Evans	1971	1967	General hospitals, Ontario	185	Average occupancy rate	Factor analyzed diagnostic categories into homogeneous output variables.
Lave & Lave	1970	14 semi-annual observations during 1961-67	General Western Pennsylvania	74	Utilization (recorded patient days/available patient days)	Assumed case mix is reasonably constant within a single hospital over a short time period.
Lave & Lave	1970	7 annual observations during 1961-67	General Eastern and Western Pennsylvania	109	Utilization (utilization as % of mean utilization for the hospital during seven-year interval)	Assumed case mix is reasonably constant within a single hospital over a short time period.
Cohen	1970	1965	Short-term, general, members of UHF of New York	46	Service units (a cost-weighted average of hospital services)	Output measured as a set of weights for various services.

** Exact sample size not given; listed sample size estimated from authors' regression analysis.

Note: This table was provided by Dr. Roger Feldman, University of Minnesota, and appears in an unpublished manuscript by staff members of BHSR & E in the School of Public Health, 1971.

Table 2.8 (continued-2)

Summary of Hospital Cost Function Studies

Study	Year	Interval Observation	Type of Hospital	Sample Size	Output Measure	Definition of Case Mix
Francisco	1970	1964	Short-term, general	4710	Total patient days	Stratified hospitals into groups on the basis of numbers and types of facilities. Assumed case mix within a department is homogeneous.
Feldstein	1968	Fiscal Year 1960-61	Acute, nonteaching in England and Wales	177	Total annual cases adjusted for case-mix variation among hospitals	Assumed case mix within a department is homogeneous and used vectors for case mix proportions.
Ingbar & Taylor	1968	Annual observations 1958-59 1962-63	Short-term, voluntary in Massachusetts	72	Available bed days	Assumed case mix is reasonably constant within a single hospital over a short period of time and case mix within a department is homogeneous.
Berry	1967	1963	Short-term, general (AHA)	763	Patient days	Stratified hospitals into groups on the basis of numbers and types of facilities.
Berry	1967 Addendum	1963	Short-term, general (AHA)	763	Average daily census	
Carr & Feldstein	1967	1963	Short-term, general (AHA)	3147	Average daily census and patient days	Assumed case mix is reasonably constant within a single hospital over a short time period and case mix within a department is homogeneous.

Note: This table was provided by Dr. Roger Feldman, University of Minnesota, and appears in an unpublished manuscript by staff members of BHSR & E in the School of Public Health, 1973.

5) included direct measures of case mix within the cost function by use of vectors for case mix proportions (M. Feldstein, 1968); used factor analysis to group diagnostic categories into homogeneous output variables (Evans, 1971; Evans & Walker, 1972) and used cluster analysis of diagnostic categories for purposive aggregation of services (Lave, Lave, & Silverman, 1972).

Despite the multiple approaches outlined above, there appears to be no satisfactory measure of hospital output according to Lave and Lave (1970). To address this concern, Lave, Lave, and Silverman (1972) designed a study to develop cost functions which would take explicit account of the multiproduct nature of hospital output without incurring multicollinearity problems (M. Feldstein, 1968; Evans & Walker, 1972; Evans, 1971). This particular effort seems most relevant to the present study in terms of research design and variables selected for inclusion as input measures.

Lave, Lave, and Silverman collected data from 65 Pennsylvania hospitals during the last half of 1968 and regressed average cost per patient day, in ordinary linear fashion against a set of variable clusters which represented either an institutional characteristic or a diagnostic characteristic. Institutional variables such as hospital size, occupancy rate, and teaching status were identified as well as variables representing the commonality of diagnosis (percentage of patients with the same diagnosis). This study showed that extreme multicollinearity would arise in cost models employing all variables

separately, thus limiting one's ability to generalize on the influence of individual explanatory factors.

Lave et al. noted that Evans (1971) had performed principal component analysis to eliminate multicollinearity and form orthogonal clusters in that study. The problem with this approach was that the clusters lost meaning and purpose. Variables in the Lave et al. study were clustered by similar regression coefficients thus taking advantage of prior information about the relationships among variables. The conclusions of the study were as follows:

1) marginal cost of care was $318.98 or 68% of average cost. The marginal cost of an additional day in the hospital was $26.09;
2) economies of scale were not significant;
3) advanced teaching hospitals and hospitals in metropolitan areas had much higher costs;
4) hospitals performing complex surgery or treating relatively large proportions of unusual cases had higher costs.

Summary of Research Issues

A common argument in favor of deinstitutionalization has been the belief that community residential facilities are less expensive than public residential facilities. From several perspectives, this argument remains debatable. Conley (1973) offered an economist's viewpoint which favored community based programs over institutional settings. The General Accounting Office report (1977) reviewed seven

studies and reported that five favored community care as a less expensive approach, while two studies reported that costs did not differ significantly when a full range of needed services were provided in both settings.

The studies that have been completed and reviewed in this paper offer results that were rarely comparable across settings or responsive to the needs of policy makers. The timeliness of cost analysis for the future direction of deinstitutionalization as a public policy was appropriately stated by Skoler (1978):

> The cost of not costing is too high to ignore. While interest groups compete for public dollars, legislators, executives, judges, and government workers must make allocative decisions against a backdrop of inflation, proposition 13's, and a rapidly decreasing tolerance for those who would plan and allocate in ignorance. (p. 2)

The first step in matching the conclusions of the existing cost studies with the projected needs of public policy makers is to identify what are the major independent and interdependent sources of cost variation. An initial list might include resident characteristics such as age, organizational characteristics such as size, and locational factors such as urban or rural location. Findings from the literature on costs of residential care for mentally retarded people will be supplemented by research results from the nursing home literature.

Resident Characteristics

Costs may vary substantially in residential facilities for mentally retarded people to the extent that particular residents require

more specialized or intensive services (Primrose, 1972; Indiana Department of Mental Health, 1975; Mayeda & Wai, 1975; Jones & Jones, 1976; O'Connor & Morris, 1978). This factor may be best illustrated in the observation by Sharfstein et al. (1977):

> One recent study of comparative costs (controlled for age, sex, and diagnostic differences) incurred by patients in United States Public Health Service Hospitals and in private voluntary hospitals concluded that the Public Health Service Hospitals' cost per stay is about one-third less than that of private hospitals. Other researchers who did not control for t. ese critical differences in patient characteristics, reported that Public Health Service Hospitals appear to be more expensive than private hospitals. (p. 30)

Rates within nursing homes have also been linked with resident characteristics. In some cases, the characteristic found to be most crucial was "personal affluence." Several researchers have found that institutions that care for elderly poor people are inferior whether discussing quantity or quality of care (Anderson, Holmberg, Schneider, & Stone, 1969; Greenwald & Linn, 1971; Kosberg, 1971; Penchansky & Taubenhaus, 1965; Townsend, 1964).

Locational Factors

Environmental factors affect the costs of residential care according to several researchers. Piasecki et al. (1977) found that facilities located in rural areas tended to have higher per diem costs. Facilities that exhibited greater degrees of compliance with state and federal regulations also reported greater operating costs (Levey, Ruchlin, Stotsky, Kinloch, & Oppenheim, 1973) in nursing homes. Regional differences within the United States have also been noted with

the Southern region operating with the lowest cost (Baumeister, 1970; Piasecki et al., 1977; Krantz, Bruininks, & Clumpner, 1978; Scheerenberger, 1978a, 1979).

Organizational Characteristics

Ownership has received greater research attention within nursing home studies than residential facility studies for mentally retarded people. Government facilities operated for mentally disabled tended to operate at higher cost levels than proprietary and nonprofit operations (Don & Amir, 1969; Piasecki et al., 1977). Evidence within the nursing home literature indicates disagreement about the relationship between ownership and cost. Anderson et al. (1969) found little difference between nonprofit and proprietary nursing homes. Gottesman (1972) concluded that nonprofit facilities were more desirable because of greater family financial support, use of volunteers, and greater number of donations.

The sociological concomitants of facility size have been thoroughly investigated but with inconclusive results. Size and quality of care within nursing homes have been positively related (Anderson, Holmberg, Schneider, & Stone, 1969; Beattie & Bullock, 1963), negatively related (Linn, 1974; Townsend, 1964), and not related at all (Gottesman, 1974; Levey et al., 1973). A further confounding influence is introduced when one considers the size of the living unit rather than the size of the facility as a whole (Goldsmith, 1971; King, Raynes, & Tizard, 1971).

The economic considerations governing size and cost (shape of the average cost curve) have more than academic interest. According to Knapp (1978):

> The conventional average cost curve has a U-shape implying that cost per unit of output initially falls as output increases as a result of economies in the use of fixed equipment (kitchen, laundry) and specialized staff (occupational therapy, medical staff) and bulk buying of supplies. Eventually the curve rises again due to the strain of overuse of equipment and buildings, increasing maintenance costs and difficulties encountered in the administration of residential services. In contrast with the U-shaped curve of residential facilities, manufacturers and industries report an L-shaped curve of average costs that do not rise once a minimum level of cost is reached. (p. 32)

Within the nursing home domain, debate also continues about the tradeoffs among size, cost, and benefits. Stotsky (1970) favored smaller facilities because of efficiency, home-like conditions, personal attention, and greater congruency with resident needs. In contrast, he felt that larger institutions tended to be dehumanizing and depersonalizing. Kosberg (1974) viewed smaller facilities as void of treatment resources and professional staff, on the verge of bankruptcy, and had administrators who were ill-trained for their positions. Larger facilities, on the other hand, had greater resources, more professional staff, greater cash flow, and provided resources that smaller facilities could not. Kosberg (1974) cautioned that the expertise within larger facilities could be lost if the staff members were too far removed from the residents.

Size has been viewed as a single determinant of cost and as an important mediating variable for other factors which influence cost

variation. The former relationship was tested by Baker, Seltzer, and Seltzer (1977). The authors found that smaller group homes for 6-10 mentally retarded residents were twice as expensive as larger group homes serving 21-40 residents. Other researchers have proposed that size affected staffing patterns which affected cost variation (Peat, Marwick, Mitchell & Co., 1976; Piasecki et al., 1977; O'Connor & Morris, 1978).

The inconclusive evidence relating size of residential facilities to cost is matched by similar results in hospital cost studies. Berki (1972) best summarizes the current state of thought about economy of scale:

> What are the shapes of the short run and long run cost functions of hospitals? Are there economies of scale? The answer from the literature is clear: "The exact general form of the function is unimportant" (Feldstein, 1967, p. 133) but "whatever its exact shape" (Ingbar & Taylor, 1968, p. 107), and depending on the methodologies and definitions used, economies of scale may exist, may not exist, or do not exist, but in any case, according to theory, they ought to exist. (p. 115)

In summary, there appears to be evidence that several variables can cause variations in cost. For purposes of this study, the variables assessed in relationship to cost of residential services have been divided into three major categories--locational factors, organizational factors, and resident factors. An adequate understanding of cost of residential services depends upon detailed analysis of all three domains.

III. METHODOLOGY

Previous cost studies in the area of residential services for mentally retarded people have typically suffered from three major weaknesses. First, the scope of previous studies was restricted to localities within states or sites within several states. National patterns have been reported only in the area of capital budgets. Second, the methodology of previous studies usually depended upon mail questionnaires, inspection of secondary records, or onsite visits, while combinations of various survey methods have not been employed. Third, previous studies have assessed concurrent information on a very limited number of attributes of the residents, organizational structure, and locational factors.

The design and methodology of the present study attempts to overcome each of these three limitations. First, the scope of the present study is national. Second, onsite visits in combination with a self report questionnaire and telephone followup ensured high response rates on survey items and more extensive verification of data than a single approach. Third, the present study was conducted as part of a larger, comprehensive in-depth study of residential facilities and the mentally retarded people who live in them. Information was collected on facility practices, staffing patterns, and policies related to residents.

A complete description of the methodology employed in the 1978-1979 in-depth interview study of community and public residential facilities is published elsewhere (Hauber, Bruininks, Wieck, Sigford, & Hill, 1980). This study was conducted in collaboration with the Survey Research Center, University of Michigan.

Sample

Public Residential Facilities

In 1977, Dr. Richard C. Scheerenberger conducted a survey of 263 public residential facilities in the United States that met the following definition:

> A state sponsored and administered facility which offered comprehensive programming on a 24-hour, 7 days-a-week basis as of June 30, 1977. (1978a, p. 2)

This survey was conducted in cooperation with the University of Minnesota Developmental Disabilities Project on Residential Services and Community Adjustment. A data tape of the results of this survey was supplied to Dr. Irene Hess, Director of the Sampling Section of the Survey Research Center at the University of Michigan. A two stage probability sample was used to sample approximately 80 public residential facilities which would represent all size categories and geographic regions in the United States. Six size classes were selected for sampling purposes. According to Hess (1979a), the selection of facilities was made proportionate to the number of mentally retarded residents served in the facilities:

> There were approximately 152,000 mentally retarded residents in public facilities in 1977. If 80 selections

> June 30, 1977, with the exception of: (a) single family homes providing services to a relative; (b) nursing homes, boarding homes, and foster homes that are not formally state licensed or contracted as mental retardation service providers; and (c) independent living (apartment) programs which have no staff residing in the same facility. (Bruininks, Hauber, & Kudla, 1979, p. 11)

The appropriate data were again supplied to Dr. Irene Hess who sampled facilities according to size class and geographic region. Fourteen sampling categories were selected in order to represent the broad range of facilities as presented in Appendix A (Table A.2). Hess (1979b) noted wide differences between the two groups of facilities:

> Immediately our attention is drawn to the striking differences in facility size between public and community facilities. Nearly 95 percent of community facilities and 60 percent of their residents are in less-than-50 residents classes, while it may be recalled that about nine percent of public facilities and only one-half of one percent of their residents were reported to be in the less-than-50 residents class. The size classes defined for public facilities are quite inappropriate for community facility stratification. (p. 1)

The sampling criteria varied with the size classes as shown in Appendix A (Table A.3). For example, facilities serving 200 or more residents were included with certainty while facilities with one, two, or three residents were sampled at a rate of 1:58. Of the six largest facilities (those with 400 or more residents), only one facility agreed to participate. After several extra efforts were made to solicit cooperation from these nonparticipating facilities, the project staff decided to keep the one facility in the study, make no adjustment for nonresponse from these large facilities, and report that the largest facilities are underrepresented.

> are to be made, there should be one sample facility for every 152,000/80 or 1,900 residents. However, there can be some gains in precision if every facility with 1,900 or more residents is included with certainty. Also, it was desirable to include with certainty some of the large facilities that had somewhat fewer than 1,900 residents. A convenient breaking point between certainty and non-certainty selections was 1,600, and the 14 facilities with 1,600 or more residents were included with certainty. There remained 249 facilities with 122,703 residents. Those estimates were adjusted downward to 121,856 which contains 1,904 exactly 64 times. Sixty-four became the number of noncertainty selections to be made, one selection for each 1,904 estimated residents.
>
> To distribute 64 selections across four regions and five size classes required the use of the probability sampling technique of controlled selection.
>
> During the data collection period, six of the sample facilities were unable to participate. Substitutions from the same size and geographic classes were made for three early refusals. To adjust for the remaining three non-participating facilities, a double weight has been assigned to three participating facilities of similar characteristics. (pp. 3-4)

Appendix A (Table A.1) presents the distribution of the total sample of 78 facilities, 14 certainty and 62 noncertainty selections, by size class and region of the United States.

Community Residential Facilities

In 1977 a national mail census was undertaken by the Developmental Disabilities Project on Residential Services and Community Adjustment at the University of Minnesota. A total of 4,427 community residential facilities which met the following definition participated in the survey and comprised the sampling frame:

> Any community-based living quarter(s) which provides 24-hour, 7 days-a-week responsibility for room, board, and supervision of mentally retarded persons as o[illegible]

Survey Instrument

A three-page questionnaire was designed to assess both the sources and amounts of revenue and the general patterns of expenses of residential facilities. The format of the self-report questionnaire was patterned after an income statement that shows changes that have occurred in the income position of an organization during a specific period of time. Gross (1978) identified several positive features of an income statement format including: a) the advantage of providing a profile of the costs associated with running the organization, b) the advantage of comparing income and expenses simultaneously, and c) the advantage of providing the contributors of resources (government agencies) with information about the use of resources by the providers of the service (p. 43).

The development of the financial questionnaire occurred over several months. Table 3.1 presents an outline of the stages of development of the survey instrument.

After reviewing several existing instruments, questions were selected from several sources. Table 3.2 presents a profile of the financial questionnaire items by source. Several concepts were important in developing the instrument and are defined below.

1. Cost: The title of this thesis includes the term cost. In common usage cost is most often used to mean expired costs which, by definition, are expenses. By standard definition, however, cost means the totality of relevant resources (expired and unexpired) used to

Table 3.1

Stages of Development of Financial Questionnaire

Stage	Activity	Time Line
#1	Project staff members reviewed the literature to compile a set of research questions.	January-July 1977
#2	Goal analysis survey of project staff and a panel of 30 national experts in the field of residential services. Two research issues emerged from the goal analysis survey as very important: 1) What are the sources and conditions for receiving the facility's program income, including services to particular residents? 2) What are the objects, purposes, amounts, and conditions of the facility's expenditures? The rating scale ranged from 1-3 with 3 as the most important and easily obtainable. Issue #1 received a rating of 2.5 on importance and 2.1 on feasibility. Issue #2 received a rating of 2.3 on importance and 1.8 on feasibility.	July 1977-January 1978
#3	Several sources were consulted in developing the questionnaire, including: Conley, 1973; D.D. Office, Survey of Public Institutions for the Mentally Retarded; NIMH Annual Census of Patient Characteristics; Social Security Administration, Survey of Institutionalized Persons; Scheerenberger, National Survey of Public Residential Facilities; National Center for Health Statistics, Nursing Home Survey. Professor Laird Heal of the University of Illinois was also consulted. From this review, a very abbreviated form was developed to assess the total operating costs and the total sources of revenue. This short interview consisting of two questions was pretested during June, 1978 in several field sites.	April-June 1978

Table 3.1 (continued)

Stages of Development of Financial Questionnaire

Stage	Activity	Time Line
#4	The financial questionnaire did not adequately handle the concerns and research issues. The administrative interviews were too long during the field test and had to be cut to one hour. The respondent was unable to handle the questions about finances and the interviewers reported feeling uneasy about handling financial questions. At this time it was decided to forego an interview and to substitute a self report questionnaire to be completed by the fiscal agent of the facility. Thus, the questionnaire could be completed separately from the interviewing time enabling the fiscal agent to complete the questionnaire at his/her own convenience. A new questionnaire was fashioned based upon the previous work in Stages #1-4. This form was tested in Minnesota on two public facilities and three community facilities. The content of the questionnaire had to include questions about the budget year or reported time period; the sources of revenue by general category of government or other contributor; the expenses by general breakdown of personnel, capital, and all other expenses; the rent, market value or appraised value; the land area or lot size; the value of furnishings; the per diem charge; and general questions about the provision of day programs in the operating expenses.	June 1978
#5	The second pretest was scheduled by the University of Michigan for July, 1978. The financial questionnaire was included for testing in several sites. A separate building inventory was also field tested. Because of the expressed difficulty of several family operators with this questionnaire, an alternative form was developed and included in the interview booklet (Appendix C). After minor modifications and the refinement of definitions, the final version of the questionnaire was completed in September, 1978. A copy of the final questionnaire is provided in Appendix B.	July 1978

Table 3.2

Financial Questionnaire Items by Source

Financial Questionnaire Items	Neal draft questionnaire (1978)	Conley (1973)	Survey of Public Institutions (DHEW, 1970)	Survey of Institutionalized Persons (1976)	Survey of PMIs (Scheerenberger, 1976a)	Nursing Home Survey (NCHS, 1976)	Peat, Marwick Mitchell, & Co. (1976)
Sources of Revenue							
1. Federal sources	X			X	X	X	X
2. State sources	X			X			X
3. Regional sources							
4. County sources							
5. Other government				X			
6. Support from residents or family (SSI)	X					X	X
7. Donations or contributions	X			X		X	X
8. Total revenue (#1-#7)	X			X		X	X
Expenses							
1. Total payroll	X				X	X	X
2. Total payroll taxes						X	X
3. Total fringes						X	X
4. Capital expenses for							
a) furniture/fixtures							X
b) equipment							X
c) buildings							X
d) leasehold improvements							X
e) land							X
5. Total capital expenses	X				X	X	X
6. All other expenses (nonpersonnel and noncapital)	X				X	X	X
7. Total expenses (#1,#5,#6)	X	X	X	X	X	X	X
Other Questions							
1. Average per diem (charge)				X			
2. Average per diem (cost)				X	X		
3. Expenses compared to income							
4. Capital expenses compared to typical year	X						
5. Figures for MR only?							
6. What percentage of expenses day services and programs?							
7. If rented, total rent	X	X				X	X
8. Appraised value of land/building							
9. Market value of land/building	X						
10. Market value of furnishings	X						X
11. Expenses for repair/maintenance	X						
12. Land area (acres/lot size)							
13. Profit/nonprofit/family owned							

produce or acquire specific goods or services. Cost is measured by the amount of cash paid for the property or services exchanged.

2. Expense/expired cost: The amount of resources consumed during a specific period of time.

3. Asset/unexpired cost: Costs not consumed during the accounting period that are, therefore, available for future use (e.g., prepaid insurance of building/equipments) (National Institute of Mental Health, 1980, p. 35).

4. Revenue: The amount received or to be received from the customer for the goods or services which the entity is supplying him (Burns & Hendrickson, 1972, p. 96).

5. Personnel expense: Salaries, wages, and fringe benefits of persons employed by the organization.

6. Capital expenses: Costs for improvements, including costs for long-term capital additions or benefits which are distributed over time.

7. Operating expenses: Supplies, articles, and materials consumed and distinguishable from equipment or other long-lived assets by being consumed within an accounting period.

8. Per diem charge: The per day per person charged for a resident to live in this facility. This figure might also be known as the reimbursement rate.

9. Per diem cost: The per day per person cost for a resident to live in this facility. The cost may exceed the rate of reimbursement or charge.

10. Fixed cost: Costs incurred regardless of the level of output such as rent, wages and salaries of some types of labor, some utilities, and some maintenance.

11. Variable cost: Costs which vary with the level of output such as supplies, food, some utilities, and some wages and salaries. Variable costs can be varied by management decisions "in the short run."

12. Direct expenses: Costs directly traceable to a particular program, department, product or function.

13. Indirect expenses: Costs not directly traceable to a particular program or product. They are expenses incurred as a general result of being in existence and presumably benefit all particular programs or products within the enterprise.

The survey instrument presented in Appendix B should be considered as a gross measure of a facility's financial status. As described in Table 3.1, the financial questionnaire was designed to assess patterns of revenue and expenditures for a one-year time period to coincide with data collected from other survey instruments. Based on field testing results, the instrument was kept very brief in recognition of the respondents' limited time and resources as well as to encourage 100% completion of all items. All of these factors precluded the development of a longer, more detailed questionnaire which would have spanned several reporting periods.

The first section of the financial questionnaire assesses the sources of revenue. For purposes of this study, revenue was divided into three sources: a) revenue generated from government sources such

as federal, state, regional, and county levels; b) revenue generated from the families of mentally retarded residents or the residents themselves; and c) revenue from contributions, donations, and all other sources.

Respondents were asked to specify the source of revenue by level of government, such as "federal," "state," or "county." In several instances, the names of specific programs were cited such as Title XX. Pre-editing of questionnaires recoded the mentioned source into one of the government categories. All money flowed through the state and was listed as such by the respondent.

The second category of revenue is the income from family and resident payments. Developmentally disabled individuals may receive assistance from Social Security or Supplemental Security Income (SSI) to pay for room, board, and related services. Families may also pay private tuition or a portion of the cost of care.

The last category of other contributions includes such sources of revenue as United Way, donations from philanthropic organizations, and other fund raisers. No attempt was made to have respondents estimate the in-kind donations of volunteer help because of difficulty in placing a dollar amount on such contributions.

The second section of the financial questionnaire contained questions relating to expenses including personnel expenses, capital expenses, and operating expenses.

A potential source of error in completing the revenue section of the survey stems from the nature of reimbursement for providing

residential services. A facility may not be able to identify and trace the exact sources of funds beyond the primary source of revenue. As a result, the state contributions to a facility may be overestimated, and the federal share may be underestimated.

The second section of the questionnaire was concerned with the breakdown of expenses by three categories: a) personnel, b) capital, and c) all other expenses.

Respondents were asked to list the total payroll expenses as well as the amount of money spent on payroll taxes and fringe benefits. Capital expenses were subdivided into the categories of furniture and fixtures, equipment, buildings, leasehold improvements, and land. All other expenses and the total operating expenses rounded out the remainder of this section. In conjunction with the total operating expenses, respondents were asked to provide the per diem rates, a common term in residential care. There were two types of per diems ascertained: a) the per day per person reimbursement rate from a government source, and b) the per day per person cost based on the total operating expenses divided by the total number of resident days (number of residents x 365 days).

An obvious limitation of the questions contained in this second section was the failure to determine whether capital assets were depreciated, whether these assets were included in the per diem rates, and the historical patterns of capital outlays.

The third and final section of the instrument contained a set of general questions regarding the value of capital investments. Based

on pretesting, it was known that respondents had to rely upon estimates in placing a dollar value on land, buildings, and furnishings. The questions were structured to determine rent, appraised value, or estimated market value of land and buildings. Other questions assessed the value of furnishings and equipment and the total number of acres or square feet owned by the facility.

Procedures

A total of 11 instruments were used during the overall in-depth interview study of facilities and residents. The financial forms and materials used for this study were part of the materials listed in Table 3.3 and Table 3.4. All survey forms, cover letters, abstracts, phone scripts, and interviewer manuals were developed by the project staff at the University of Minnesota between January 1, 1978 and September 1, 1978. Field testing occurred within facilities in Canada in June, 1978 and in the United States at several facilities in July, 1978 as documented in Table 3.1.

The actual interviews were conducted between September, 1978 and April, 1979 at 236 facilities. Trained interviewers from the Survey Research Center of the University of Michigan conducted the onsite interviews under the supervision of the field office at Ann Arbor. The project staff at the University of Minnesota collaborated with the University of Michigan in ensuring quality control in conducting the study. Step by step procedures were developed by the University of Minnesota staff in guiding the interviewers through the visit. Training

Table 3.3

Data Collection Forms Used in National Sample Survey: Facility Forms

Item	Completion Method	Completed by	Purpose
Cover Sheet Facility Admin.		Interviewer	Names of facility & respondents. Date & time of interview
Facility Admin. Questionnaire	Interview	Interviewer	Characteristics & information on policies, procedures, plans, etc. of facility
Building Description Sheets Forms A & B	Usually self-administered	Facility Administrative Staff	Number of total buildings. Specific information on residential buildings.
Show cards for Facility Admin. Questionnaire			Visual aids
Financial Questionnaire	Self-administered	Facility Accountant or other person responsible for finances	Sources of income, expenditures, general financial information
Letter to Financial Officer			Introduce Financial Questionnaire to Finance Officer
Release of information for Financial Questionnaire	Self-administered	Facility Administrator	Authorizes accountant to complete financial questionnaire
Staff Composition Sheet (Pub. & Comm.)	Self-administered	Facility Administrative Staff	To collect information on types of staff employed, especially direct care staff
Staff Separations (Pub. Facilities)	Self-administered	Facility Administrative Staff	To collect detailed information on staff turnover for one-month period.

Table 3.4

Data Collection Forms Used in National Sample Survey: Resident Forms

Instrument	Completion Method	Completed by	Purpose
Respondent Determination Sheet	Ask knowledgeable administrative staff	Interviewer	Selection of Direct Care Staff member to be interviewed
Release of Information Forms		To be signed by parent or guardian	To authorize information from records
Personal Record Sheet	Self-administered or interview	Care Personnel or interviewer or staff with access to records	To collect basic demographic information on selected resident
Cover Sheets-Care Personnel Questionnaire		Usually the interviewer	Gives names of selected residents and care person respondents
Care Personnel Questionnaire	Interview Care Personnel for each selected resident	Interviewer	Characteristics of resident, day program, services, behavior problems
Respondent Booklet			Visual Aids for Care Personnel Questionnaire
Behavior Description Booklet	Self-administered	Care Personnel Respondent	To collect adaptive behavior description for each selected resident
Care Personnel Self-administered Booklet	Self-administered	Care Personnel	Job satisfaction scale and selected items about facility practices

materials were also provided by the Minnesota staff to assure standardized procedures in handling each interview. In addition, two comprehensive (236 page) interviewer manuals were developed separately for the public and community facilities.

Interviewers from the Survey Research Center usually conducted a pre-visit to the facility to present an overview of the survey instruments, establish a work plan, and set time lines for completion of tasks. At this pre-visit, the most appropriate fiscal agent of the facility was selected to complete the financial questionnaire. Whenever possible, the financial questionnaire was assigned as quickly as possible to allow the respondent time to complete work on the questions. Any problems related to the completion of the financial questionnaire were handled directly by the project staff at the University of Minnesota. Interviewers were responsible for picking up the completed questionnaires and transmitting them to the Field Office at Ann Arbor. Almost all accountants, bookkeepers, and business managers cooperated fully and completed the questionnaires with no problems.

The codebooks and training materials for coders were also developed by the Minnesota staff. All editing of questionnaires was completed by the project staff on frequent visits to Michigan. All telephone follow-up work was conducted by the project staff. A complete description of the editing, coding, and follow-up procedures is described elsewhere (Hauber, Bruininks, Wieck, Sigford, & Hill, 1980).

Editing and Preparation of Data

One source of potential error occurs in the recording, coding, and handling of data. Verification of financial data occurred in a systematic process over several months. The recording, coding, and updated corrections of financial variables were handled on an item by item basis (100% check) at least six times during July, 1979 through June, 1980. Special checks on 100% of the data were made to determine valid zeroes from missing data.

Survey respondents invariably do not answer all questions. In order to make population estimates of the financial information provided by the sample respondents, missing values were imputed. At the suggestion of the Sampling Section of the University of Michigan, estimated values were supplied based upon the average value of that item matched for Census region and size of facility.

In a few instances, some facilities did not participate in the study. Adjustment for facility nonresponse occurred as part of the weighting procedures for population estimates based on disproportionate stratified samples. The weight assigned to a facility was the reciprocal of the probability of that facility's selection in the sample. Reciprocal weights were assigned by the Sampling Section of the Survey Research Center.

The population figures presented in Chapter IV represent estimates of the true revenues, expenses, and capital investments of public and community residential facilities. All estimates have been rounded off to the thousand dollar place. Appendix D contains the sampling errors for specific population estimates.

IV. RESULTS

Results will be presented in the same order as the study objectives. First, revenues, expenses, and capital investments will be presented for public residential facilities, community residential facilities, and combined groups. Second, analysis of per diem rates by selected organizational factors will be presented to test stated hypotheses. Third, cost function analyses are presented of multiple factors that may influence per diem cost rates.

Descriptive Analysis

The total revenue for public residential facilities (PRF) during 1977-1978 is presented in Table 4.1 and totals $2.63 billion. Government sources account for 98% of the PRF revenue or $2.57 billion. The single largest contributor to public residential facilities is state support which totaled over $1.9 billion. Federal and family support may be underestimated due to the inability of respondents to separate and identify those sources from state appropriations. Counties and regions were identified as contributing the least amount of money to public residential facilities.

Table 4.2 presents the total revenue for community residential facilities in 1977-1978. In contrast with the total revenue of $2.63 billion for PRFs, the total revenue for CRFs was significantly less at

Table 4.1

Total Revenue of PRFs in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Source	Dollars	% Total
Total Government	$2,570,000,000	98%
Federal	642,200,000	
State	1,923,376,000	
Region	--	
County	14,000	
Other (Government source not specified)	4,410,000	
Total Resident/Family	43,000,000	2%
Total Donations	13,600,000	< 1%
U.S. Total Revenues	$2,626,600,000	100%

Table 4.2

Total Revenue of CRFs in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Source	Dollars	% Total
Total Government	$350,565,000	72%
Federal	125,147,900	
State	120,409,900	
Region	9,402,000	
County	26,168,400	
Other (Government source not specified)	69,436,800	
Total Resident/Family	93,095,000	19%
Total Donations	40,386,000	9%
U.S. Total Revenues	$484,046,000	100%

$484 million. However, the number of mentally retarded residents in PRFs totaled 151,972 and the number of residents in CRFs totaled 62,397 of of June 30, 1977.

Although government sources comprised a large proportion of revenue (72%), the proportion of resident and family contributions as well as donations were appreciably higher in CRFs than in PRFs. The relative dollar amounts from each source were more equally divided in CRFs: federal sources ($125 million), state ($120 million), county ($26 million), other government sources ($69 million), resident/family ($93 million), and total donations ($40 million).

The population estimate of combined revenue for CRFs and PRFs is presented in Table 4.3. In 1977-1978, the total revenue received by public and community residential facilities equalled $3.11 billion. Government sources accounted for 94% of that total ($2.9 billion) while resident/family contributions were 4% of the total ($136 million) and donations equalled 2% or $54 million.

Providing residential care to mentally retarded people is a labor intensive industry that requires 24-hour supervision of varying intensity. The personnel costs of public residential facilities reflect the size and type of resident served (75% are severely or profoundly mentally retarded (Scheerenberger, 1978a). Table 4.4 summarizes the expenses for public residential facilities. The payroll expenses of public residential facilities totaled $2.165 billion or 79% of the total expenses. Of that amount payroll taxes equalled 9% or $186 million and fringe benefits totaled $230 million or 11%.

Table 4.3

Total Revenue of PRFs and CRFs in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Source	Dollars	% Total
Total Government	$2,920,565,000	94%
Federal	767,347,000	
State	2,043,785,900	
Region	9,402,000	
County	26,169,800	
Other (Government source not specified)	73,846,800	
Total Resident/Family (SSI)	136,095,000	4%
Total Donations	53,986,000	2%
U.S. Total Revenues	$3,110,646,000	100%

Other operating expenses such as transportation, food, resident training, staff training, and consumable supplies accounted for 16% of expenses or $428 million. Capital expenses such as furniture and equipment totaled $142 million or 5% of the total expenses of $2.7 billion.

Personnel expenses in community residential facilities consumed 52% of the $518 million total expenses or $268 million. As shown in Table 4.5 the proportion of money (52%) was considerably less than the proportion spent in PRFs for personnel (79%). In the several "family run" facilities personnel expenses are extremely low since there is no formal payment of salaries or fringe benefits. Community residential facilities, on the whole, are much smaller, have fewer staff members, and do not employ specialists to provide day and support services.

Table 4.4

Total Expenses of PRFs in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type	Dollars	% Total
Total Payroll	$2,165,378,000	79%
Total Payroll Taxes	185,942,000	
Total Fringe Benefits	229,729,000	
Total Capital Expenses	141,972,000	5%
Furniture & Fixtures	11,239,000	
Equipment	21,803,000	
Buildings	93,647,000	
Leasehold Improvements	13,891,000	
Land	1,492,000	
Total All Other Expenses	428,160,000	16%
U.S. Total Expenses	$2,735,510,000	100%

Table 4.5

Total Expenses of CRFs in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type	Dollars	% Total
Total Payroll	$267,605,000	52%
Total Payroll Taxes	19,698,000	
Total Fringe Benefits	11,146,000	
Total Capital Expenses	59,989,000	12%
Furniture & Fixtures	12,422,000	
Equipment	4,972,000	
Buildings	35,865,000	
Leasehold Improvements	3,055,000	
Land	3,675,000	
Total All Other Expenses	193,521,000	36%
U.S. Total Expenses	$517,815,000	100%

Payroll taxes and fringe benefits were considerably less (11% or $30.7 million) when compared to the proportion of these expenses in PRFs (20% or $314 million).

Other operating expenses such as transportation, food, and consumable supplies accounted for 36% of the total expenses ($194 million) of community residential facilities. Capital expenses for furniture, equipment, and remodeling totaled $60 million or the remaining 12% of the total expenses.

Table 4.6 shows the combined total expenses of PRFs and CRFs. The total expenses of $3.25 billion are greater than the total revenue of $3.11 billion in Table 4.3. The difference between revenue and expenses represents approximately a 4% deficit spending level. The difference of $14 million may be due to three causes: a) rounding errors, b) nonprofit facilities tend to run at deficit levels while proprietary facilities tend to operate with a profit margin due to the implicit costs of personnel rather than the direct expenses of salaries for the proprietor, and c) the dominant form of payment for residential services is reimbursement by third party payers after care is rendered (Johns, Chapman, & Raphael, 1976). This method may allow reimbursement of service providers for costs incurred with payments rendered after the accounting period has ended. The combination of paying for costs incurred as well as lag in reimbursement time may account for the majority of the $14 million. Personnel expenses ($2.4 billion) account for 75% of the total expenses of $3.25 billion. All other operating expenses ($622 million) total 19% of the total, followed by capital expenses ($202 million).

Table 4.6

Total Expenses of PRFs and CRFs in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type	Dollars	% Total
Total Payroll	$2,432,983,000	75%
Total Payroll Taxes	205,640,000	
Total Fringe Benefits	240,875,000	
Total Capital Expenses	201,961,000	6%
Furniture & Fixtures	23,661,000	
Equipment	26,775,000	
Buildings	129,512,000	
Leasehold Improvements	16,946,000	
Land	5,167,000	
Total All Other Expenses	621,681,000	19%
U.S. Total Expenses	$3,253,325,000	100%

One of the most difficult questions posed to respondents was an estimated appraised value of land, buildings, and equipment. Placing a price on buildings that are specially constructed facilities or which may be built over several years of a facility's operation has perplexed several researchers in the past. Given the various assumptions and estimates made by survey respondents, Tables 4.7, 4.8, and 4.9 present the best indications of capital investments.

For public residential facilities, the total appraised value of land and buildings totaled $4.01 billion, the value of furnishings was approximately 11% of that figure or $439 million. Annual maintenance expenses for capital items were estimated at $40 million for PRFs in

Table 4.7

Total Value of Capital Investments for PRFs
in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type	Dollars
Total Appraised Value of Land & Buildings	$4,009,360,000
Total Value of Furnishings	439,277,000
Total Maintenance Expenses	39,609,000
Total Number of Acres	12,359 acres

Table 4.8

Total Value of Capital Investments for CRFs
in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)

Type	Dollars
Total Appraised Value of Land & Buildings	$1,289,630,000
Total Value of Furnishings	136,793,000
Total Maintenance Expenses	11,792,000
Total Number of Acres	3,441 acres

Table 4.9

Total Value of Capital Investments for PRFs and CRFs
in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)

Type	Dollars
Total Appraised Value of Land & Buildings	$5,299,000,000
Total Value of Furnishings	576,071,000
Total Maintenance Expenses	51,401,000
Total Number of Acres	15,801 acres

1977-1978. The total number of acres held by PRFs was approximately 12,359.

Capital investments are considerably less for CRFs than PRFs as shown in Table 4.5. The appraised value of land and buildings was $1.29 billion, with furnishings totaling $137 million. Maintenance expenses totaled $11.8 million and the total number of acres held by CRFs was approximately 3,441.

The total value of capital investments for all PRFs and CRFs was $5.3 billion as shown in Table 4.9. The total value of furnishings was $576 million and the total maintenance expenses were $51 million. Approximately 15,801 acres are held by public and community residential facilities.

Respondents were asked to give both the per day per person reimbursement rate and the per day per person cost of residential care. Table 4.10 presents a breakdown of per diem reimbursement rates and per diem cost rates. In most cases the reimbursement rate reported by public residential facilities was $2.00 - $3.00 less than the cost rate. Community residential facilities differed by $1.00 - $2.00 between the charge and cost rates. Per diem reimbursement rates are also presented by facility size categories. Public residential facilities with fewer than 500 residents reported the highest per diem of $60.05. Lower per diems were reported for larger facilities: $41.68 for facilities with 500-999 residents, $47.81 for facilities with 1,000-1,599 residents, and $46.82 for facilities with more than 1,600 residents. In contrast, community residential facilities showed

Table 4.10

Comparison of Per Diems for PRFs and CRFs
in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)

	Mean	SD
PRF Per Diem Charge (Weighted for nonresponse)	$49.91	21.65
PRF Per Diem Cost (Weighted for nonresponse)	52.57	22.74
CRF Per Diem Charge (Weighted for nonresponse)	18.71	11.50
CRF Per Diem Cost (Weighted for nonresponse)	20.29	12.81

Size of PRFs	Average Per Diem
< 500	$60.05
500 - 999	41.68
1,000 - 1,599	47.81
1,600 +	46.82

Size of CRFs	Average Per Diem
1 - 5	$15.51
6 - 15	16.40
16 - 32	18.86
33 - 64	25.50
65 +	25.09

a steady progression in per diem rates, with the smallest facilities having the lowest per diem ($15.51) and the larger facilities reporting higher per diems ($25.09).

Descriptive Analysis by Census Regions

The patterns of revenue for PRFs and CRFs are presented by census regions in Tables 4.11 and 4.12. As described in Chapter III, Hess selected the sample of facilities to represent the census regions thus allowing geographic comparisons.

The census regions are defined as follows:

1. Northeastern Region

   Connecticut
   Maine
   Massachusetts
   New Hampshire
   New Jersey
   New York
   Pennsylvania
   Rhode Island
   Vermont

2. North Central Region

   Illinois
   Indiana
   Iowa
   Kansas
   Michigan
   Minnesota
   Missouri
   Nebraska
   North Dakota
   Ohio
   South Dakota
   Wisconsin

3. Southern Region

   Alabama
   Arkansas
   Delaware
   District of Columbia
   Florida
   Georgia
   Kentucky
   Louisiana
   Maryland
   Mississippi
   North Carolina
   Oklahoma
   South Carolina
   Tennessee
   Texas
   Virginia
   West Virginia

4. Western Region

   Alaska
   Arizona
   California
   Colorado
   Hawaii
   Idaho
   Montana
   Nevada
   New Mexico
   Oregon
   Utah
   Washington
   Wyoming

Table 4.11

Sources of Revenue of PRFs by Census Region in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Source	Northeast	North Central	South	West
Government	$861,156,000	$696,103,000	$642,507,000	$373,541,000
Federal	286,413,000	129,178,000	171,449,000	56,784,000
State	574,501,000	565,259,000	467,543,000	316,757,000
Regional	--	--	--	--
County	--	--	14,000	--
Other (Government source not specified)	242,000	1,666,000	3,501,000	--
Resident/Family	14,327,000	8,992,000	17,636,000	2,105,000
Contributions	2,414,000	3,434,000	7,531,000	409,000
Total	$877,897,000	$708,529,000	$667,674,000	$376,055,000

Table 4.12

Sources of Revenue of CRFs by Census Region in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Source	Northeast	North Central	South	West
Total Government	$ 83,664,000	$124,217,000	$ 63,707,000	$ 74,923,000
Federal	25,936,000	40,854,000	24,080,000	32,860,000
State	30,683,000	36,202,000	35,254,000	16,851,000
Regional	--	1,270,000	--	8,132,000
County	7,688,000	13,710,000	3,015,000	1,350,000
Other (Government source not specified)	19,357,000	32,181,000	1,358,000	15,730,000
Resident/Family	23,164,000	31,982,000	26,526,000	10,267,000
Contributions	5,754,000	8,490,000	10,640,000	15,000,000
Total	$112,582,000	$164,689,000	$100,873,000	$100,190,000

The estimated revenue for PRFs in the Northeastern region ($878 million) as shown in Table 4.11 is greater than revenue for any other region. The PRFs in North Central states reported the next highest revenue ($708 million) followed by the Southern region ($668 million) and the West ($376 million). The proportion of revenue contributed by government services was approximately 98% in all four regions.

Table 4.12 provides a similar profile of revenue for CRFs. In contrast, the North Central region reported the highest amount of revenue with $165 million followed by the Northeastern states with $113 million. The Southern region reported slightly higher revenues ($101 million) than the CRFs in the Western states ($100 million).

In examining the relative contributions of sources across regions, one can detect a few notable trends. The government contributions vary from 63% in the Southern region to 75% in all other regions. Within governmental sources, state contributions showed the greatest range from 23% in the West to 55% in the South. County support to residential facilities is proportionally higher in the North Central region (11%) and Northeast region (10%) when compared to the South and West. Resident/family contributions showed little proportional variation across regions: Northeast (21%), North Central (19%), South (26%), and West (10%).

The PRFs in the Northeast region recorded the largest expenses ($932 million) followed by the Southern region ($719 million), the North Central ($699 million), and the West ($374 million) as shown in Table 4.13.

Table 4.13

Expenses of PRFs by Census Regions in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type	Northeast	North Central	South	West
Total Payroll Expenses	$760,869,000	$556,571,000	$545,610,000	$294,721,000
Payroll Taxes	63,445,000	60,080,000	36,852,000	24,797,000
Fringe Benefits	98,364,000	54,913,000	47,218,000	28,466,000
Total Capital Expenses	19,239,000	32,826,000	65,704,000	22,982,000
Furniture & Fixtures	2,768,000	1,513,000	4,313,000	2,522,000
Equipment	2,821,000	5,378,000	9,556,000	3,865,000
Buildings	9,644,000	24,819,000	46,497,000	11,895,000
Leasehold Improvements	2,965,000	935,000	5,068,000	4,700,000
Land	1,041,000	181,000	270,000	--
All Other Expenses	151,998,000	109,765,000	108,210,000	56,505,000
Total Expenses	$932,106,000	$699,162,000	$719,524,000	$374,208,000

Payroll expenses in PRFs ranged from $295 million in the West upward to $761 million in the Northeast region. Capital expenses in PRFs were similar in the Northeast and Western regions, $19 million and $23 million, respectively. The South and North Central states reported considerably higher capital expenses of $66 million and $33 million, respectively. All other operating expenses averaged approximately 15% across all regions.

Table 4.14 illustrates a somewhat similar description of expenses for CRFs by census regions. The rank order of expenses for CRFs by census regions is: North Central ($183 million), Northeast ($123 million, South ($109 million), and West ($107 million). Some regional variation in proportional money spent on payroll can be noted with the Northeast and North Central regions reporting approximately 54% of all expenses for payroll, and the South and West reporting 50% and 44%, respectively. The capital expenses reported by the CRFs in the North Central region ($17.8 million), Southern region ($17.9 million), and Western region ($16.7 million) are very similar while the Northeastern region shows a substantially lower amount ($7.7 million). All other operating expenses were proportionally similar: West (40%), Northeast (39%), North Central (37%), and South (33%).

The capital investments of public residential facilities in land and buildings are fairly comparable in all four regions: Northeast ($1.06 billion), North Central ($1.15 billion), West ($1.003 billion), and South ($795 million). Approximately 10% of these respective amounts was listed as the value of furnishings: Northeast ($137 million),

Table 4.14

Expenses of CRFs by Census Regions in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type	Northeast	North Central	South	West
Total Payroll Expenses	$67,899,000	$97,317,000	$55,029,000	$47,310,000
Payroll Taxes	4,933,000	7,343,000	3,623,000	3,799,000
Fringe Benefits	3,615,000	3,489,000	2,131,000	1,911,000
Total Capital Expenses	7,703,000	17,771,000	17,907,000	16,674,000
Furniture & Fixtures	1,979,000	5,215,000	2,549,000	2,679,000
Equipment	1,117,000	1,903,000	771,000	1,180,000
Buildings	4,352,000	8,073,000	12,949,000	10,559,000
Leasehold Improvements	78,000	1,927,000	262,000	788,000
Land	177,000	653,000	1,376,000	1,468,000
All Other Expenses	47,608,000	67,238,000	35,730,000	43,144,000
Total Expenses	$123,210,000	$182,326,000	$108,666,000	$107,128,000

North Central ($138 million), South ($108 million), and West ($55 million). The Southern PRFs held the largest amount of land with 4,213 acres. The Northeast region reported 3,611 acres followed by the West with 1,529 acres and North Central with 3,006 acres.

Community residential facilities reported appraised value of land and buildings as $238 million in the Northeast, $389 million in the North Central states, $223 million in the Southern region, and $439 million in the West. The value of furnishings showed wide variation from a low of $14 million in the South to $20 million in the Northeast, $49 million in the West to the highest reported value of $53 million in the North Central region. The total number of acres held by CRFs in each region was as follows: Northeast (607 acres), North Central (1,761 acres), South (482 acres), and West (274 acres). Tables 4.15 and 4.16 present the profiles of capital investments for PRFs and CRFs.

Descriptive Analysis by Size Categories

In no single dimension do PRFs differ more from CRFs than in terms of size or number of mentally retarded residents. CRFs ranged in size from 1 resident to over 400, while PRFs served as few as 10 residents to over 3,000 residents.

For analysis purposes the sample public residential facilities were grouped into four size categories: a) less than 500 residents (n=18), b) 500 to 999 residents (n=25), c) 1,000 to 1,599 residents (n=21), and d) 1,600 or more residents (n=11). In contrast with this distribution, the sample CRFs were divided as follows: a) 1 to 5

Table 4.15

Capital Investments of PRFs by Census Regions in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type	Northeast	North Central	South	West
Appraised Value of Land & Buildings	$1,060,770,000	$1,150,530,000	$794,695,000	$1,003,350,000
Appraised Value of Furnishings	137,431,000	138,429,000	108,291,000	55,125,874
Maintenance & Repair Expenses	6,596,000	9,757,000	18,539,000	4,716,000
Total Number of Acres of Land	3,611 acres	3,006 acres	4,213 acres	1,529 acres

Table 4.16

Capital Investments of CRFs by Census Regions in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type	Northeast	North Central	South	West
Appraised Value of Land & Buildings	$237,836,000	$389,241,000	$223,534,000	$439,024,000
Appraised Value of Furnishings	20,209,000	52,761,000	14,520,000	49,303,000
Maintenance & Repair Expenses	2,784,000	4,680,000	2,061,000	2,267,000
Total Number of Acres of Land	607 acres	1,761 acres	482 acres	274 acres

residents (n=39), b) 6 to 15 residents (n=58), c) 16 to 63 residents (n=31), and d) 64 or more residents (n=33).

Tables 4.17 and 4.18 present the revenue patterns of PRFs and CRFs, respectively, by size of facility. The proportion of money (98%) coming from government sources is consistent across all size groups of public residential facilities with no relationship detected between size and reimbursement patterns. The federal-state share of revenue reported by respondents in the smaller size categories was 31%/68% while the larger categories reported a 17%/83% split. The specific federal-state patterns were: size category 1, 32%/68%; size category 2, 31%/69%; size category 3, 15%/85%; and size category 4, 19%/81%. Once again, the estimates provided by the respondents may underestimate the true federal share. The relative proportion of non-government contributions equalled 1%-2% for each size group. When combined, the size categories of 500-1,599 residents accounted for over $1.54 billion in revenue or 59% of all revenue reported. This combined size group also accounts for 39.6% of all residents in public residential facilities.

The revenue patterns of CRFs, as shown in Table 4.18, show an increasing growth in total revenue reported as the size of facilities increases. The estimated revenue of facilities with 1 to 5 residents was $38.2 million; 6 to 15 residents was $118 million; 16 to 63 residents was $138 million; and 64 or more residents was $190 million.

Government was the largest source of revenue across all community facilities with facilities of 6 to 15 residents receiving 82% of its

Table 4.17

Sources of Revenues of PRFs by Size Groups in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Source	Number of Residents			
	< 500	500 - 999	1,000 - 1,599	1,600 +
Total Government	$693,756,000	$836,785,000	$675,878,000	$366,888,000
Federal	220,289,000	251,913,000	103,732,000	67,889,000
State	472,382,000	580,735,000	572,132,000	298,811,000
Regional	--	--	--	--
County	--	--	14,000	--
Other	1,085,000	4,137,000	--	188,000
Resident/Family	9,213,000	19,456,000	8,988,000	5,403,000
Contributions/Donations	4,958,000	2,676,000	3,589,000	2,567,000
Total	$707,927,000	$858,917,000	$688,455,000	$374,858,000

Table 4.18

Sources of Revenues of CRFs by Size Groups in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Source	Number of Residents			
	1 - 5	6 - 15	16 - 63	64 +
Total Government	$30,949,000	$ 96,288,000	$ 89,694,000	$129,579,000
Federal	1,915,000	19,947,000	40,119,000	61,748,000
State	11,333,000	38,725,000	30,016,000	38,917,000
Regional	--	4,796,000	1,270,000	3,336,000
County	1,523,000	9,143,000	10,085,000	5,011,000
Other (Government source not specified)	16,178,000	23,677,000	8,204,000	20,567,000
Resident/Family	5,807,000	19,251,000	31,213,000	35,668,000
Contributions/Donations	1,419,000	2,468,000	16,599,000	19,398,000
Total	$38,175,000	$118,007,000	$137,506,000	$184,645,000

revenue from government sources followed by facilities with 1 to 5 residents (81%), 64 or more residents (70%), and 16 to 63 residents (63%). The greatest use of donations and other contributions was reported by facilities in the upper size ranges: 16 to 63 residents (12%) and 64 or more residents (11%). These larger facilities were usually residential schools with church or other private affiliations. Resident and family revenue accounted for 15% of the total revenue in the smaller size categories and approximately 20% in the larger facilities serving 16 residents or more.

The expenses of PRFs and CRFs are reported in Tables 4.19 and 4.20, respectively. PRF personnel expenses ranged from 75% of the budget in facilities of fewer than 500 residents to 83% of the budget in the second largest category, 1,000 to 1,599 residents. Capital expenses showed little spread across the size categories averaging between 3% and 7% of the budget. The remainder of approximately 13% to 19% of the budget in all size categories was spent on all other operating expenses.

The expense patterns reported by CRFs show greater diversity than those of PRFs. In facilities serving 16 or more residents, the proportion of money spent on personnel, capital and other operating expenses totaled approximately 57%, 9%, and 34%, respectively. Facilities with fewer than 5 residents spent a lower proportion of money on personnel (28%) than facilities with 6 to 15 residents (42%). The lowest proportion of money spent on capital items (8%) was reported by facilities with 16 to 63 residents, whereas the proportion reported by facilities with 1 to 15 residents was 16%.

Table 4.19

Expenses of PRFs by Size Groups in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type	Number of Residents			
	< 500	500 - 999	1,000 - 1,599	1,600 +
Total Payroll Expenses	$552,641,000	$679,058,000	$628,885,000	$297,187,000
Payroll Taxes	41,917,000	43,503,000	75,316,000	24,438,000
Fringe Benefits	44,846,000	72,717,000	81,040,000	30,358,000
Total Capital Expenses	36,088,000	61,907,000	25,394,000	17,993,000
Furniture & Fixtures	2,463,000	2,424,000	4,720,000	1,510,000
Equipment	5,196,000	7,160,000	5,601,000	3,662,000
Buildings	14,809,000	51,298,000	14,115,000	12,632,000
Leasehold Improvements	13,016,000	86,000	378,000	189,000
Land	604,000	309,000	580,000	--
All Other Expenses	142,235,000	127,288,000	97,616,000	59,339,000
Total Expenses	$730,964,000	$868,253,000	$751,895,000	$374,519,000

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Table 4.20

Expenses of CRFs by Size Groups in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type of Expense	Number of Residents			
	1 - 5	6 - 15	16 - 63	64 +
Total Payroll Expenses	$10,495,000	$ 54,557,000	$ 84,077,000	$118,495,000
Payroll Taxes	730,000	4,393,000	6,404,000	8,171,000
Fringe Benefits	648,000	2,272,000	2,429,000	5,797,000
Total Capital Expenses	5,971,000	21,151,000	11,602,000	21,333,000
Furniture & Fixtures	2,368,000	4,041,000	2,172,000	3,841,000
Equipment	541,000	1,046,000	1,358,000	2,027,000
Buildings	2,955,000	13,507,000	7,397,000	12,074,000
Leasehold Improvements	107,000	885,000	499,000	1,565,000
Land	--	1,672,000	176,000	1,826,000
All Other Expenses	20,610,000	54,221,000	49,987,000	68,903,000
Total Expenses	$37,076,000	$129,929,000	$145,596,000	$208,731,000

The reported capital investments of public and community residential facilities combined by size categories are presented in Tables 4.21 and 4.22, respectively. The total appraised value of PRF land and buildings of over $4 billion was unevenly distributed across size categories: fewer than 500 residents ($1.28 billion), 500 to 999 residents ($1.5 billion), 1,000 to 1,599 residents ($856 million), and 1,600 or more residents ($354 million). The land holdings showed a similar pattern with facilities of less than 500 residents reporting 3,294 acres, facilities of 1,000 to 1,599 residents listing 3,790 acres, and facilities of over 1,600 residents owning 1,144 acres. The largest amount of land was held by facilities with 500 to 999 residents (4,132 acres).

The appraised values of land and buildings of community residential facilities by size categories are given in Table 4.22. The breakdown by size categories is as follows: facilities of 1 to 5 residents reported $109 million, facilities of 6 to 15 residents reported $189 million, facilities with 16 to 63 residents reported $545 million and facilities with 64 or more residents reported $448 million in appraised value of land and buildings. The amount of land ranged from 528 acres (facilities with 1 to 5 residents) to 1,720 acres (facilities with 64 or more residents).

Relation of Selected Factors to Cost

Several single factors were cited in Chapter II which may influence variation in per diem costs. For organizational purposes these single

Table 4.21

Capital Investments of PRFs by Size Groups in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type	Number of Residents			
	< 500	500 - 999	1,000 - 1,599	1,600 +
Appraised Value of Land & Buildings	$1,283,690,000	$1,515,880,000	$855,650,000	$354,140,000
Appraised Value of Furnishings	144,648,000	115,386,000	116,535,000	62,708,000
Maintenance & Repair Expenses	13,624,000	9,685,000	12,238,000	4,063,000
Number of Acres of Land	3,294 acres	4,132 acres	3,790 acres	1,144 acres

Table 4.22

Capital Investments of CRFs by Size Groups in United States in 1977-1978
(U.S. Probability Sample, 1978-1979, 100% Reporting)
Population Estimates

Type	Number of Residents			
	1 - 5	6 - 15	16 - 63	64 +
Appraised Value of Land & Buildings	$108,691,000	$188,823,000	$544,567,000	$447,554,000
Appraised Value of Furnishings	16,296,000	20,546,000	61,392,000	38,560,000
Maintenance & Repair Expenses	649,000	1,684,000	3,263,000	6,196,000
Number of Acres of Land	528 acres	539 acres	655 acres	1,720 acres

factors have been grouped under three major categories: 1) locational factors, 2) organizational factors, and 3) resident factors. Within each category, separate hypotheses will be stated, followed by the results tested at the .05 levels of statistical significance.

Locational Factors

There are two environmental factors that were tested separately for public residential facilities and community residential facilities.

1. H_{o_1}: There is no difference in the per diem of residential services located in the four census regions (Northeast, North Central, West, and South).

There were significant differences in the per diem rates of public residential facilities located in the four census regions according to the results of a one-way analysis of variance test. The PRFs located in the Northeastern region were operating at the highest rate of $62.19 while PRFs in the South had the lowest rate of $41.75. These two means were significantly different ($p < .05$), while the other comparisons were not. The analysis of variance and table of means and standard deviations appear in Tables 4.23 and 4.24, respectively.

When the community residential facility per diems were analyzed, there were no significant differences among the four census regions. Table 4.25 and Table 4.26 present the analysis of variance and table of means. The per diem means are quite comparable: Northeast ($22.44), North Central ($20.79), South ($20.36), and West ($18.28).

The data contained in this report have not been adjusted for cost of living differences that exist across census regions. Future

Table 4.23

Summary of Analysis of Variance
of PRF Per Diems by Census Region

Source of Variation	df	SS	MS	F
Between Groups	3	4686.51	1562.17	3.59*
Within Groups	71	30901.28	435.23	
Total	74	35587.79		

* $p < .05$

Table 4.24

Mean Per Diems of PRFs by Census Region

Census Region	Mean	SD	N
Northeast	$ 62.19	31.36	21
North Central	$ 50.58	15.61	19
South	$ 41.75	16.01	24
West	$ 50.91	9.78	11

Table 4.25

Summary of Analysis of Variance
of CRF Per Diems by Census Region

Source of Variation	df	SS	MS	F
Between Groups	3	317.09	105.70	.77
Within Groups	157	21642.48	137.85	
Total	160	21959.56		

Table 4.26

Mean Per Diems of CRFs by Census Region

Census Region	Mean	SD	N
Northeast	$ 22.44	10.79	32
North Central	$ 20.79	12.98	62
South	$ 20.36	12.97	28
West	$ 18.28	9.19	39

analyses of this cost data will adjust for such differences using a comparative index published by the Bureau of Labor Statistics (1979). The index is developed for a hypothetical urban family of four consisting of an "employed husband, age 38, a wife not employed outside the home, an 8-year-old girl, and a 13-year-old boy" (p. 21). Separate annual family budgets were reported for lower, intermediate, and higher levels of consumption.

The budgets and indexes are prepared for 39 metropolitan areas and four nonmetropolitan areas in the United States. Indexes for the four census regions are not reported, and according to Rogers (1980) from the Bureau of Labor Statistics, "the 39 metropolitan areas represent an extremely small sample of the census regions."

The reader should be advised that the statistically significant difference in PRF per diems might be an illusion of cost of living differences rather than "real" cost differences.

2. H_{o_2}: There is no difference in the per diem of residential services located in the metropolitan and nonmetropolitan areas.

A Standard Metropolitan Statistical Area (SMSA) usually consists of a central city with a population exceeding 50,000, the county in which it is located, and other contiguous counties that are metropolitan in character and are socially and economically integrated with a central city (U.S. Department of Commerce, 1978). For purposes of this study, residential facilities were recategorized into three categories of location: a) SMSA central for facilities which were located in cities of 50,000 people or more, b) SMSA noncentral county

for facilities located in contiguous counties, and c) non-SMSA counties for the remainder of the facilities which are located outside an SMSA.

One-way analysis of variance tests were run separately for public residential facility per diems and community residential facility per diems. As shown in Tables 4.27 and 4.29, there were no significant differences between location for either group of facilities. The table of means and standard deviations for PRFs is given in Table 4.28, while Table 4.30 presents the CRF means and standard deviations.

Organizational Factors

Seven organizational characteristics have been suggested in the review of literature as affecting cost differences. The eight factors are: 1) size, 2) staff turnover rate, 3) staff-resident ratio, 4) index of service/staffing patterns, 5) occupancy rate, 6) ownership of facility, 7) membership in a system or chain of residential facilities under one general ownership, and 8) number of years in operation. Factors 4, 6, and 7 are applicable to community residential facilities only.

3. H_{o_3}: There is no relationship between the per diem of residential services and size of facility (number of mentally retarded residents).

Pearson correlation coefficients were calculated between size and per diem rates for PRFs and CRFs, separately. The size of public residential facilities was negatively, but not significantly, correlated with the per diem of those facilities (r= -.12). In contrast, the size of community residential facilities was positively correlated with per

Table 4.27

Summary of Analysis of Variance
of PRF Per Diems by Metropolitan Location

Source of Variation	df	SS	MS	F
Between Groups	2	415.87	207.94	.43
Within Groups	72	35171.91	488.50	
Total	74	35587.79		

Table 4.28

Mean Per Diems of PRFs by Metropolitan Location

Location	Mean	SD	N
(1) SMSA Central (city with 50,000)	$ 51.87	23.78	31
(2) SMSA Noncentral County	$ 55.90	28.14	10
(3) NonSMSA County	$ 48.88	18.33	34

Table 4.29

Summary of Analysis of Variance
of CRF Per Diems by Metropolitan Location

Source of Variation	df	SS	MS	F
Between Groups	2	498.72	249.36	1.84
Within Groups	158	21460.84	135.83	
Total	160	21959.56		

Table 4.30

Mean Per Diems of CRFs by Metropolitan Location

Location	Mean	SD	N
(1) SMSA Central (city with 50,000)	$ 22.11	11.30	84
(2) SMSA Noncentral County	$ 18.43	8.58	14
(3) NonSMSA County	$ 18.63	12.64	63

diem (r= .22) which was statistically significant ($p < .005$). However, this correlation was rather low and accounted for only about 5% of the variance in costs.

4. H_{O4}: There is no relationship between per diem of residential services and the turnover rate of direct care staff.

Pearson product correlation coefficients were calculated separately for PRFs and CRFs. The relationship between the turnover rate of direct care staff and the per diem rates was negatively correlated for public residential facilities (r= -.11), but the relationship was not statistically significant. The relationship between turnover rate and per diem in community residential facilities was also negatively correlated (r= -.19) and was also not statistically significant.

5. H_{O5}: There is no relationship between per diem of residential services and the staff-resident ratio.

The staff-resident ratio was calculated for each facility based on the total number of staff, given on the staff composition questionnaire, divided by the total number of mentally retarded residents. The staff-resident ratios were divided into five groups: a) less than .33, b) .33-.65, c) .66-.99, d) 1.00-1.32, and e) 1.33+.

One-way analysis of variance tests were run separately for public residential facility per diems and community residential facility per diems. Significant differences ($p < .005$) were found in per diem rates of public residential facilities as shown in Table 4.31. Upon examination of the table of means given in Table 4.32, there appears to be a direct relationship between higher staff-resident ratios and higher per diem costs.

Table 4.31

Summary of Analysis of Variance
of PRF Per Diems by Staff-Resident Ratio

Source of Variation	df	SS	MS	F
Between Groups	3	10306.19	3435.40	9.65**
Within Groups	71	25281.60	356.08	
Total	74	35587.79		

** $p < .005$

Table 4.32

Mean Per Diems of PRFs by Staff-Resident Ratio

Staff-Resident Ratio	Mean	SD	N
< .33	NA	NA	NA
.33 - .65	$ 30.00	0	1
.66 - .99	$ 44.66	14.99	44
1.00 - 1.32	$ 54.00	13.52	23
1.33+	$ 84.57	43.98	7

Differences in community residential facility per diems were also significant ($p < .005$) when compared on staff-resident ratio groups (Table 4.33). The lowest per diem ($15.32) occurred in facilities with a staff-resident ratio of less than .33. The mean per diems and standard deviations are given in Table 4.34. The highest per diem of $28.88 was reported by facilities with staff-resident ratios of 1.00 to 1.32. Those facilities with staff-resident ratios greater than 1.33 reported per diems ($16.50) considerably lower than facilities with staff-resident ratios ranging from .66-1.32.

6. H_{O_6}: There is no relationship between per diem rates of residential services and an index of service/staffing patterns.

All public residential facilities in the sample provided a full range of services by a full complement of staff. In contrast, community residential facilities offered several different levels of service from domiciliary care to a full range of services similar to public facilities. The staff composition questionnaire was completed by each facility and was scored according to an index of service/staffing patterns according to types of staff employed. The index was defined as follows:

1 = Family run; no other staff employed

2 = Direct care staff and at least a part-time administrator

3 = Direct care staff, administrator(s), and facility support staff such as kitchen or laundry workers

4 = Direct care staff, administrator(s), facility support staff, educational support staff, and medical support staff

5 = Direct care staff and administrator(s), facility support staff, educational support staff, medical support staff, and social services support staff

Table 4.33

Summary of Analysis of Variance
of CRF Per Diems by Staff-Resident Ratio

Source of Variation	df	SS	MS	F
Between Groups	4	4489.09	1122.27	10.02**
Within Groups	156	17470.48	111.99	
Total	160	21959.57		

** $p < .005$

Table 4.34

Mean Per Diems of CRFs by Staff-Resident Ratio

Staff-Resident Ratio	Mean	SD	N
< .33	$ 15.32	8.62	53
.33 - .65	$ 19.22	8.57	50
.66 - .99	$ 28.03	13.95	40
1.00 - 1.32	$ 28.88	9.06	8
1.33+	$ 16.50	14.28	10

A one-way analysis of variance test was run on the community residential facility per diems and the results appear in Table 4.35. Significant differences were found ($p < .0005$) among group means with the lowest per diem rate ($11.85) reported by facilities that were family owned and operated. The highest per diem of $31.47, on the other hand, was reported by facilities offering a full range of services. Level 1 facilities ($11.85) were significantly different from all other levels. Level 2 facilities ($19.00) were significantly less expensive than level 4 facilities ($24.14) and level 5 facilities ($31.47). Finally, level 3 ($22.38) and level 4 facilities differed significantly from level 5 facilities (see Table 4.36).

7. H_{o7}: There is no difference in the per diem rates of residential services and the occupancy rate.

Occupancy rate was defined as the number of residents divided by the bed capacity. Occupancy ranged from less than 70% to over 100%, and the rates were recategorized as follows: a) $\leq$ 70%, b) 71-90%, c) 91-95%, d) 96-100%, and e) >100%. No significant differences were found in comparing means of public and community residential facilities. Tables 4.37 and 4.39 present the analysis of variance tables for public and community facilities, while Tables 4.38 and 4.40 present the tables of means and standard deviations, respectively.

8. H_{o8}: There is no difference in per diem rates of community residential facilities by type of legal ownership (family, private nonprofit corporations, proprietary corporations).

Table 4.41 presents a summary of the analysis of variance (see Table 4.42 for means and standard deviations) for type of legal ownership with per diem as the dependent variable. There were significant

Table 4.35

Summary of Analysis of Variance
of CRF Per Diems by an Index of Service/Staffing Patterns

Source of Variation	df	SS	MS	F
Between Groups	4	5463.81	1365.95	12.92***
Within Groups	156	16495.75	105.74	
Total	160	21959.56		

*** $p < .0005$

Table 4.36

Mean Per Diems of CRFs by an Index of Service/Staffing Patterns

Intensity of Services/Staffing	Mean	SD	N
Level 1 - Family Run	$ 11.85	6.17	34
Level 2 - Direct Care & Administrator	$ 19.00	11.20	56
Level 3 - Direct Care & Administrator & Facility Support Staff	$ 22.83	10.10	23
Level 4 - Direct Care & Administrator & Facility Support Staff & Educational Support Staff & Medical Staff	$ 24.14	10.74	29
Level 5 - Direct Care & Administrator & Facility & Medical & Educational & Social Service Support Staff	$ 31.47	12.61	19

Table 4.37

Summary of Analysis of Variance
of PRF Per Diems by Occupancy Rate

Source of Variation	df	SS	MS	F
Between Groups	5	4757.11	951.42	2.13
Within Groups	69	30830.68	446.82	
Total	74	35587.79		

Table 4.38

Mean Per Diems of PRFs by Occupancy Rate

Occupancy Rate	Mean	SD	N
Level 1 (< 50%)	NA	NA	NA
Level 2 (50- 70%)	$ 61.00	31.37	6
Level 3 (71- 80%)	$ 42.20	13.77	5
Level 4 (81- 90%)	$ 52.94	16.51	18
Level 5 (91- 95%)	$ 64.08	33.69	13
Level 6 (96-100%)	$ 43.28	12.75	18
Level 7 (> 100%)	$ 45.80	17.18	15

Table 4.39

Summary of Analysis of Variance
of CRF Per Diems by Occupancy Rate

Source of Variation	df	SS	MS	F
Between Groups	6	586.66	97.78	.71
Within Groups	154	21372.91	138.79	
Total	160	21959.57		

Table 4.40

Mean Per Diems of CRFs by Occupancy Rate

Occupancy Rate	Mean	SD	N
Level 1 (<50%)	$ 16.90	9.90	20
Level 2 (50- 70%)	$ 23.73	15.12	15
Level 3 (71- 80%)	$ 19.23	14.82	17
Level 4 (81- 90%)	$ 19.03	10.75	29
Level 5 (91- 95%)	$ 21.25	10.43	16
Level 6 (96-100%)	$ 21.60	11.43	60
Level 7 (>100%)	$ 20.25	8.66	4

Table 4.41

Summary of Analysis of Variance
of CRF Per Diems by Type of Ownership

Source of Variation	df	SS	MS	F
Between Groups	2	4513.06	2256.53	20.44***
Within Groups	158	17446.51	110.42	
Total	160	21959.56		

*** p <.0005

Table 4.42

Mean Per Diems of CRFs by Type of Ownership

Type	Mean	SD	N
Nonprofit	$ 24.16	11.57	87
Family Run	$ 12.45	7.41	49
Proprietary	$ 23.12	11.71	25

differences among the mean per diems with family-owned and operated facilities ($12.45) operating at a much lower rate than nonprofit facilities ($24.16), and proprietary facilities ($23.12). However, no significant difference emerged between nonprofit and proprietary facilities. The mean per diems and standard deviations appear in Table 4.42.

9. H_{o9}: There is no difference in per diem rates of community residential facilities by membership in a system. (A system is a group of residential facilities owned and operated by one parent organization.)

Significant differences ($p < .05$) were found between community residential facilities that were members of systems and those that were not. The average per diem of system CRFs was $22.75 and the average per diem of non-system CRFs was $17.72. Table 4.43 presents the analysis of variance table while Table 4.44 gives the table of means and standard deviations.

10. H_{o10}: There is no difference in per diem rates of residential facilities by the number of years in operation.

Facility administrators were asked to give the year when the residential facility opened. The opening year was subtracted from the constant year 1978. The years in operation were recategorized into four groups: a) 1-6 years, b) 7-20 years, c) 21-50 years, and d) more than 50 years. One-way analysis of variance tests were calculated separately for public and community residential facility per diems. Significant differences ($p < .05$) were found for public residential facilities with the highest per diem ($72.28) reported by facilities opened for 1-6 years. Tables 4.45 and 4.46 present the

Table 4.43

Summary of Analysis of Variance
of CRF Per Diems by System Membership

Source of Variation	df	SS	MS	F
Between Groups	1	959.09	959.09	7.50*
Within Groups	150	19195.43	127.97	
Total	151	20154.52		

* $p < .05$

Table 4.44

Mean Per Diems of CRFs by System Membership

Type	Mean	SD	N
Member of System	$ 22.75	11.99	81
Non-member	$ 17.72	10.49	71

Table 4.45

Summary of Analysis of Variance
of PRF Per Diems by Number of Years in Operation

Source of Variation	df	SS	MS	F
Between Groups	5	3749.02	1249.67	2.79*
Within Groups	71	31838.77	448.43	
Total	74	35587.79		

* $p < .05$

Table 4.46

Mean Per Diems of PRFs by Number of Years in Operation

Number of Years	Mean	SD	N
1 - 6 years	$ 72.28	43.35	7
7 - 20 years	$ 50.76	16.80	21
21 - 50 years	$ 51.00	23.76	13
> 50 years	$ 46.88	15.71	34

summary of the analysis of variance test and the table of means and standard deviations for public facilities, respectively. No significant differences were reported by community residential facilities as shown in Tables 4.47 and 4.48.

Resident Factors

11. H_{o11}: There is no difference in the per diem rates of residential services and the age of residents served.

Facility administrators were asked about the age criteria for admission of residents. There are three basic types of facilities--those which serve only children, those which serve only adults, and those which serve all ages. Specific minimum and maximum ages within these types may vary from facility to facility. One-way analysis of variance tests were run separately for public and community residential facilities. There were no significant differences in public residential facilities, as shown in Tables 4.49 and 4.50.

On the community side, the per diem rates for adult facilities ($18.39) were significantly lower ($p < .005$) than residential placements for children ($24.74) or all ages ($24.67). The summary table is given in Table 4.51 and the table of means and standard deviations appears in Table 4.52.

12. H_{o12}: There is no difference in the per diem rates of residential services and the number of levels of mentally retarded residents admitted.

Facility administrators were asked which levels of mentally retarded residents were admitted, using the four levels of mental retardation (mild, moderate, severe, and profound), according to the

Table 4.47

Summary of Analysis of Variance
of CRF Per Diems by Number of Years in Operation

Source of Variation	df	SS	MS	F
Between Groups	3	593.46	197.82	1.45
Within Groups	155	21208.28	136.82	
Total	158	21801.75		

Table 4.48

Mean Per Diems of CRFs by Number of Years in Operation

Number of Years	Mean	SD	N
1 - 6 years	$ 20.58	11.53	85
7 - 20 years	$ 19.03	11.40	59
21 - 50 years	$ 24.80	15.37	10
> 50 years	$ 28.00	9.67	5

Table 4.49

Summary of Analysis of Variance
of PRF Per Diems by Age of Resident Admitted

Source of Variation	df	SS	MS	F
Between Groups	2	1508.49	754.24	1.59
Within Groups	72	34079.30	473.32	
Total	74	35587.79		

Table 4.50

Mean Per Diems of PRFs by Age of Resident Admitted

Age of Residents	Mean	SD	N
Children	$ 36.00	9.20	4
Adults	$ 40.50	11.56	4
All Ages	$ 52.58	22.50	67

Table 4.51

Summary of Analysis of Variance
of CRF Per Diems by Age of Resident Admitted

Source of Variation	df	SS	MS	F
Between Groups	2	1404.93	702.46	5.40**
Within Groups	158	20554.64	130.09	
Total	160	21959.57		

** $p < .005$

Table 4.52

Mean Per Diems of CRFs by Age of Resident Admitted

Age of Residents	Mean	SD	N
Children	$ 24.74	13.27	31
Adults	$ 18.39	10.30	109
All Ages	$ 24.67	13.80	21

AAMD Classification System (Grossman, 1977). The number of levels of mental retardation represents a proxy variable for "case mix" that was described in the hospital cost function studies of Chapter II. Facilities were categorized according to the number of levels of retardation admitted with the possible values equal to one, two, three, or four levels.

One-way analysis of variance tests were run separately for public and community residential facilities. Tables 4.53, 4.54, 4.55, and 4.56 present the results. No significant differences were found for either analysis.

13. $H_{o_{13}}$: There is no difference in the per diem rates of residential services and the proportion of severely/profoundly mentally retarded residents served.

As described in Chapter III, a personal record sheet was completed for every resident included in the sample. This form included a question regarding the resident's degree of retardation based upon the most recent psychological evaluation. Residents were classified in the following manner: a) borderline (IQ 69-84), b) mild (IQ 52-68), c) moderate (IQ 36-51), d) severe (IQ 20-35), e) profound (IQ 19 and below), and f) unknown. The proportion of residents who were classified as severely or profoundly mentally retarded was calculated for each facility. Public residential facilities tend to be populated exclusively by these two levels of retardation while community residential facilities showed greater variability in the levels of retardation served.

One-way analysis of variance tests were run separately for public and community residential facilities. No significant differences for

Table 4.53

Summary of Analysis of Variance of PRF Per Diems
by Number of Levels of Mentally Retarded Residents Admitted

Source of Variation	df	SS	MS	F
Between Groups	2	1643.97	821.98	1.74
Within Groups	72	33943.82	471.44	
Total	74	35587.79		

Table 4.54

Mean Per Diems of PRFs by Number of Levels
of Mentally Retarded Residents Admitted

Number of Levels	Mean	SD	N
One level	NA	NA	NA
Two levels	$ 64.13	11.48	8
Three levels	$ 47.42	16.21	19
Four levels	$ 50.31	24.53	48

Table 4.55

Summary of Analysis of Variance of CRF Per Diems
by Number of Levels of Mentally Retarded Residents Admitted

Source of Variation	df	SS	MS	F
Between Groups	3	587.62	195.87	1.44
Within Groups	157	21371.95	136.13	
Total	160	21959.57		

Table 4.56

Mean Per Diems of CRFs by Number of Levels
of Mentally Retarded Residents Admitted

Number of Levels	Mean	SD	N
One level	$ 17.85	8.93	27
Two levels	$ 19.64	11.64	50
Three levels	$ 19.67	13.15	33
Four levels	$ 23.07	11.94	51

public residential facility per diems were found as shown in Table 4.57. The table of means and standard deviations appears in Table 4.58. Significant differences ($p < .005$) were found among the community residential facility per diems as presented in Table 4.59. Community residential facilities that served a majority (51% or more) of severely or profoundly retarded residents reported a significantly higher level per diem than facilities serving 50% or fewer residents with the same diagnosis. The table of means and standard deviations is given in Table 4.60.

Cost Function Analysis

The final statistical analyses to be described in this study are cost function analyses using multiple regression procedures.

The two primary purposes in selecting multiple regression analyses for this study are: a) to derive the best linear prediction equation from a large set of independent variables discussed in the previous section of this chapter and b) to evaluate the respective contributions of a specific variable while holding other factors constant within a multivariate context.

A stepwise linear regression approach was selected because this method orders the inclusion of independent variables by relative contributions in explaining variance. In addition, at each step, variables are entered only if they meet certain statistical criteria and are deleted if they no longer meet that criteria. By entering variables one by one it is possible to identify and examine the minimum set of

Table 4.57

Summary of Analysis of Variance of PRF Per Diems by Proportion of Severely or Profoundly Mentally Retarded Residents Served

Source of Variation	df	SS	MS	F
Between Groups	2	1626.40	813.20	1.72
Within Groups	72	33961.39	471.69	
Total	74	35587.79		

Table 4.58

Mean Per Diems of PRFs by Proportion of Severely or Profoundly Mentally Retarded Residents Served

Proportion	Mean	SD	N
0 - 75% severely or profoundly mentally retarded	$ 46.86	27.47	28
76 - 90% severely or profoundly mentally retarded	$ 50.07	19.89	28
91 - 100% severely or profoundly mentally retarded	$ 58.68	12.71	19

Table 4.59

Summary of Analysis of Variance of CRF Per Diems by Proportion of Severely or Profoundly Mentally Retarded Residents Served

Source of Variation	df	SS	MS	F
Between Groups	2	1753.15	876.58	6.85**
Within Groups	158	20206.41	127.89	
Total	160	21959.56		

** $p < .005$

Table 4.60

Mean Per Diems of CRFs by Proportion of Severely or Profoundly Mentally Retarded Residents Served

Proportion	Mean	SD	N
0% severely or profoundly mentally retarded	$ 17.00	9.42	64
1 - 50% severely or profoundly mentally retarded	$ 20.50	11.16	50
51 - 100% severely or profoundly mentally retarded	$ 25.04	13.60	47

variables that yields the optimal predictive value. The independent variable explaining the greatest amount of variance in the dependent variable appears first in the resulting equation. The remaining variables are ordered from largest to smallest in order of the magnitude of the squared partial correlation with the dependent variable. The dependent measure was per diem cost.

A common set of predictors was chosen from the list of variables presented earlier to be tested as correlates of costs of care for both public and community residential facilities. This common set of predictors included ten variables: a) staff to resident ratio, b) proportion of severely or profoundly mentally retarded residents within the facility, c) age of residents served within the facility, d) size of facility, e) number of years in operation, f) census regions, g) occupancy rate, h) number of levels of mental retardation admitted to the facility, i) staff turnover, and j) metropolitan/ nonmetropolitan location. Multiple regression requires that variables are measured on either a ratio or interval scale. Because some of the predictors in this set are nominal in nature, dummy variables were created. For example, census region was defined as Northeast, North Central, South, and West. All facilities belong to only one of these categories and can be scored as either present (1) or absent (0) on each of these four variables. A facility in the Northeast census region was scored as one (1) on the dummy variable representing Northeast and zero (0) on all other categories. In this example, three dummy variables are included in the equation and the remaining census

region is called the reference category (a unique combination of the other dummy variables).

Three regression analyses were run and will be presented in the following order: a) regression for public residential facilities using a common set of predictors, b) regression for community residential facilities using a common set of predictors, and c) regression for community residential facilities using the common set of predictors with additional factors unique to community facilities only.

Table 4.61 presents a correlation matrix of the predictors and per diem cost for public residential facilities. Staff to resident ratio was most highly correlated with per diem cost ($r=.49$, $p<.001$). In descending order of magnitude, per diem cost was correlated with the Northeast census region ($r=.31$, $p<.01$), the South census region ($r=-.29$, $p<.05$), staff turnover ($r=-.23$, $p<.05$), and occupancy rate ($r=-.19$, $p<.10$). Upon further examination of the inter-correlation matrix there appear to be only low to moderate levels of correlation between several independent variables. There is no evidence of multicollinearity among the independent variables.

The correlation ratios are in agreement with the analysis of variance results reported earlier. Higher staff to resident ratios were associated with higher per diems. Location in the Northeast census region was related to higher per diems while facilities located in the Southern census region had lower per diems. Inverse relationships existed between per diem and staff turnover, and per diem and occupancy rate. Factors such as age of residents, level of mental

Table 4.61

Correlation Matrix of Predictors and Dependent Variable for Public Residential Facilities

	Per Diem	1	2	3	4	5	6	7	8	9	10	11	12
1 Staff to Resident Ratio	.49												
2 Severe/Profound MR	.12	.07											
3 Children Admitted	-.16	-.08	-.15										
4 Adults Admitted	-.11	.13	-.38	-.06									
5 Size	-.09	-.28	-.03	-.19	-.20								
6 Operating Years	-.16	-.14	.05	-.20	-.24	.43							
7 Northeast Census	.31	.18	-.14	-.15	-.15	.18	.05						
8 North Central Census	-.01	.08	.04	.00	.13	-.20	.24	-.36					
9 South Census	-.29	.02	.02	.22	-.04	.00	-.28	-.43	-.40				
10 Number of MR Levels	-.13	-.09	-.16	.08	-.01	.04	.13	-.01	.04	-.08			
11 Occupancy Rates	-.19	-.19	-.12	.05	-.17	.16	.15	.05	-.10	.12	-.06		
12 Staff Turnover	-.23	.02	-.34	.49	.14	-.25	-.26	-.14	-.11	.41	.02	.02	
13 Metropolitan Location	-.06	.05	.23	.12	-.26	-.10	.08	.01	.04	.00	-.05	.11	.04

retardation, size, and metropolitan location were not found to be statistically significant in the previous analyses of variance and are similarly quite low in magnitude of correlation with per diem rates as given in Table 4.61.

The results of the regression analysis for public residential facilities are presented in Table 4.62. The overall regression equation accounted for 48% of the variance in per diems (multiple R = .69), and was significant at the $p < .005$ level. Four variables, in particular, were very significant determinants of per diem rates and they were: a) staff to resident ratio, b) South census region, c) number of years in operation, and d) adults only admitted. The latter three variables were negatively correlated with the dependent variable.

The greatest amount of variance ($R^2 = .24$) was consumed by staff to resident ratio. Location in the Southern census region was inversely related to cost but accounted for approximately 9% of the change in variability accounted for as shown in Table 4.62. Approximately 3% of the change in variability accounted for was due to the number of years a public residential facility was in operation. Newer facilities reported higher per diem costs. The final of four factors considered most significant was the adult age limit of some public facilities. Adult facilities reported lower per diems than facilities serving children of all ages. The change in variability accounted for by this factor was approximately 6%.

Table 4.62

Stepwise Multiple Regression Analysis of Public Residential Facilities

Independent Variable	Simple r	Multiple R	R^2	R^2 Change	Beta Weight	F Ratio	Significance Level
Staff to Resident Ratio	.49	.49	.24	.24	.49	18.05	<.0001
South Census Region	-.29	.57	.33	.09	-.30	13.91	<.0001
Operating Years	-.16	.60	.36	.04	-.31	10.73	<.0001
Adults Admitted (only)	-.11	.65	.42	.06	-.29	10.20	<.0001
Metropolitan Location	-.06	.67	.44	.02	-.11	8.67	<.0001
Staff Turnover	-.23	.68	.46	.01	-.10	7.47	<.0001
Number of MR Levels	-.13	.68	.46	.006	-.08	6.45	<.0001
Size	-.09	.68	.47	.006	.09	5.66	<.0001
Occupancy Rate	-.19	.69	.47	.004	-.07	5.01	<.0001
Proportion of Severely or Profoundly Mentally Retarded	.12	.69	.48	.001	-.04	4.44	<.0001
Children Admitted (only)	-.16	.69	.48	.001	-.04	3.97	<.0001
Northeast Census Region	.32	.69	.48	.0004	.05	3.57	.001
North Central Census Region	-.01	.69	.48	.001	.05	3.24	.002

A second regression analysis using the common set of predictors was performed on the community residential facilities. A correlation matrix of the predictors and the dependent variable for community residential facilities is given in Table 4.63. Per diem was most highly correlated with the proportion of severely or profoundly mentally retarded served by community residential facilities ($r=.28$, $p < .05$). Other variables that showed moderate correlation with per diem were: size and per diem ($r=.25$, $p < .05$), adult age limit and per diem ($r= -.25$, $p < .05$), and staff turnover and per diem ($r= -.22$, $p < .05$). As described earlier, community residential facilities reported higher per diems as size of the facility grew larger and as the proportion of severely or profoundly mentally retarded people served by a facility increased above 50%. Adults were less expensive to serve than children, while lower staff turnover was associated with facilities reporting a higher per diem. Factors such as the number of years in operation, census region, metropolitan location, occupancy rate, and the number of levels of mental retardation served by a facility were not found to be statistically significant in earlier analyses and are not correlated highly with per diem as shown in Table 4.63. Again, there appears to be no evidence of multicollinearity among the independent variables.

The stepwise regression analysis for community residential facilities is reported in Table 4.64. The overall regression equation accounted for 24% of the variance in the per diems (multiple $R = .49$). The proportion of severely or profoundly mentally retarded residents

Table 4.63

Correlation Matrix of Predictors and Dependent Variable for Community Residential Facilities

	Per Diem	1	2	3	4	5	6	7	8	9	10	11	12
1 Staff Resident Ratio	.16												
2 Severe/Profound MR	.28	.07											
3 Children Admitted	.18	.02	.20										
4 Adults Admitted	-.25	-.05	-.31	-.71									
5 Size	.25	-.03	.13	.03	-.29								
6 Operating Years	.15	.07	.12	.15	-.41	.53							
7 Northeast Census	.08	-.04	-.18	.03	-.02	-.04	.02						
8 North Central Census	.02	.09	.10	-.06	.08	.06	-.03	-.39					
9 South Census	.00	.00	.01	-.02	.00	.06	.05	-.23	-.36				
10 Number of MR Levels	.15	.01	.25	.05	-.17	.25	.13	-.04	.10	.05			
11 Occupancy Rates	.13	-.27	.26	.12	-.20	.17	.10	.04	-.06	.04	.14		
12 Staff Turnover	-.22	.02	.03	-.12	.14	-.06	-.13	-.22	.01	-.03	-.25	-.11	
13 Metropolitan Location	-.14	.07	-.03	-.18	.12	.04	.13	-.03	.24	-.06	.01	-.17	-.12

Table 4.64

Stepwise Multiple Regression Analysis of Community Residential Facilities

Independent Variable	Simple r	Multiple R	R^2	R^2 Change	Beta Weight	F Ratio	Significance Level
Proportion of Severely or Profoundly Mentally Retarded	.28	.28	.08	.08	.23	5.63	.020
Staff Turnover	-.22	.36	.13	.05	-.20	4.88	.011
Size	.25	.41	.17	.04	.22	4.40	.007
Metropolitan Location	-.14	.44	.20	.03	-.18	3.95	.006
Staff to Resident Ratio	.16	.47	.22	.03	.17	3.67	.006
Northeast	.08	.48	.23	.01	.13	3.15	.009
North Central	.02	.48	.23	.00	.09	2.71	.016
Adults	-.25	.49	.24	.00	-.05	2.39	.026
Operating Years	.15	.49	.24	.00	-.04	2.10	.044

served by facilities accounted for the greatest proportion of variability (multiple R = .28). The remainder of the factors consumed relatively small amounts of variability: staff turnover (R^2 change = .05), size (R^2 change = .04), metropolitan location (R^2 change = .03), and staff to resident ratio (R^2 change = .03). In contrast to PRFs, factors such as South census region, occupancy rate, number of levels of mental retardation, and age of admission (children) were not predictive of costs for community facilities and were eliminated from the final regression equation.

In addition to the common set of predictors that affect both public and community residential facilities, there are several additional factors that are applicable only to community residential facilities. These additional variables include index of staffing/ services, membership in a system, and ownership (family run, profit, nonprofit). A complete matrix of all of these factors is presented in Table 4.65.

The correlation matrix of this expanded set of variables (Table 4.65) reveals a moderate degree of relationship between family owned facilities and per diem ($r= -.45$, $p < .05$), and index of staffing and per diem ($r=.48$, $p < .05$). Family owned and operated facilities reported significantly lower per diems than facilities operated as nonprofit or proprietary corporations. Similarly, facilities that offered greater levels of staffing and services reported higher per diems according to earlier results. The last factor of this expanded set was membership in a system, which showed a moderate correlation

Table 4.65

Correlation Matrix of a Second Set of Predictors and Dependent Variable for Community Residential Facilities

	Per Diem	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Staff Resident Ratio	.16																
2 Severe/Profound MR	.28	.07															
3 Children Admitted	.18	.02	.20														
4 Adults Admitted	-.25	-.05	-.31	-.71													
5 Size	.25	-.03	.13	.03	-.29												
6 Operating Years	.15	.07	.12	.15	-.41	.53											
7 Northeast Census	.08	-.04	-.18	.03	-.02	-.04	.02										
8 North Central Census	.02	.09	.10	-.06	.08	.06	-.03	-.39									
9 South Census	.00	.00	.01	-.02	.00	.06	.05	-.23	-.36								
10 Number of MR Levels	.15	.01	.25	.05	-.17	.25	.13	-.04	.10	.05							
11 Occupancy Rate	.13	-.27	.26	.12	-.20	.17	.10	.04	-.06	.04	.14						
12 Staff Turnover	-.22	.02	.03	-.12	.14	-.06	-.13	-.22	.01	-.03	-.25	-.11					
13 System Membership	.16	.16	-.05	-.02	.09	.05	-.13	.10	-.06	.18	-.04	.07	.07				
14 Family Operated	-.45	-.04	-.14	-.05	.05	-.30	-.13	-.13	-.06	-.20	-.15	-.25	.08	-.38			
15 Profit Operated	-.34	-.08	-.03	-.10	.10	-.15	-.05	-.12	.09	-.19	-.04	-.23	-.03	-.38	.72		
16 Index of Staffing/Services	.48	.19	.21	.13	-.24	.53	.36	.09	.00	.14	.24	.20	-.18	.27	-.59	-.40	
17 Metropolitan Location	-.14	.07	-.03	-.18	.12	.04	.13	-.03	.24	-.06	.01	-.17	-.12	-.17	.12	.14	-.07

with per diem (r=.16). Multicollinearity among independent variables did not occur.

The results of the stepwise regression analysis with the second set of factors is reported in Table 4.66. The overall regression equation accounted for greater variability, 38% with a multiple R = .62, as contrasted with the previous analysis using a common set of predictors (R^2=24%, multiple R = .49). Of greatest importance to the change in explained variability was the first factor, the index of staffing/services which accounted for the same amount of variability as the overall equation of the previous analysis. In addition, family ownership, the proportion of severely or profoundly mentally retarded residents served, and staff turnover also made significant contributions to the prediction of costs. Family ownership and staff turnover were inversely related to cost.

Table 4.66

Stepwise Multiple Regression Analysis of Community Residential Facilities with a Second Set of Factors

Independent Variable	Simple r	Multiple R	R^2	R^2 Change	Beta Weight	F Ratio	Significance Level
Index of Staffing/Services	.48	.48	.23	.23	.23	20.69	<.0001
Family Owned	-.45	.52	.28	.04	-.23	12.75	<.0001
Proportion of Severely or Profoundly Mentally Retarded	.28	.55	.31	.03	.19	9.73	<.0001
Staff Turnover	-.22	.57	.33	.02	-.20	7.99	<.0001
Metropolitan Location	-.14	.58	.34	.01	-.12	6.63	<.0001
South	.00	.59	.35	.01	-.09	5.70	<.0001
Staff to Resident Ratio	.16	.60	.36	.01	.07	5.01	<.0001
Adults	-.25	.61	.37	.01	-.13	4.47	<.0001
Profit	-.35	.61	.37	.00	-.10	3.97	.001
Occupancy Rate	.13	.61	.38	.00	-.07	3.57	.001
Number of MR Levels	.15	.61	.38	.00	-.04	3.20	.002
Operating Years	.15	.62	.38	.00	-.05	2.90	.003
Size	.25	.62	.38	.00	.03	2.64	.006
Children	.25	.62	.38	.00	-.03	2.41	.010
North Central Census Region	.02	.62	.38	.00	.02	2.21	.017

V. DISCUSSION

Results will be discussed in the same order as presented in the last chapter. The order of topics will be 1) revenue, 2) expenses, 3) capital investments, 4) selected factors related to cost, and 5) cost function analysis.

Revenue

In order to interpret the estimated revenue for public and community residential facilities, an appropriate context of national patterns in the health care industry must be established.

The U.S. Congressional Budget Office reported in 1977 on the long term care needs of elderly and disabled people. The report estimated that between 1.9 to 2.7 million people received long term care under government programs in 1975 but the total demand for services was about 5.5 to 9.9 million people. During this same year, federal, state, and local governments spent $5.7 to $5.8 billion on long term care with the federal share (56%) estimated to be $3.1 billion. Approximately 77% of the federal money came from Medicaid.

During the past 25 years, the long term care expenditures have reflected the broader pattern of growth in the national health sector. Between 1950 and 1970, medical care prices increased almost twice as fast as all prices as measured by the Consumer Price Index. The

following indicators demonstrate the significant growth in cost in the health area as reported in the government publication, Health, United States, 1978:

> From 1966 to 1975, nursing home expenditures rose more than 500%. In 1976, the nursing home industry reported expenditures of $10.6 billion. The 1977 outlay of $12.6 billion was almost 10 times the level of 1965 expenditures. (p. 96)
>
> Between 1965 and 1977, public expenditures rose at nearly twice the rate of private expenditures. By 1977, public expenditures accounted for 42% of all spending for health care, up from the relatively stable 25% share from 1950 to 1965, the years just preceding implementation of Medicare and Medicaid. (p. xvii)
>
> National health expenditures rose to $162.6 billion in fiscal year 1977, or $737 per person. The health expenditure accounted for the largest share of the Gross National Product yet reported for health expenditures (8.8%). (p. xvii)

The responsibility for residential care of mentally retarded people is and will continue to be distributed between the public and private sectors. The President's Committee on Mental Retardation (1976) estimated that for all mental retardation programs:

> Public costs are divided approximately 10% federal and 90% state and local. Private costs fall probably about 70% upon families, with 30% divided among voluntary fund raising operations, service organizations, and private foundations. The percent division between public and private sectors is difficult to estimate with any precision because of the lack of hard data, especially on family contributions. (pp. 131-132)

Conley (1973) concluded that residential care for mentally retarded people is costly, while Blatt et al. (1976) stated that residential care is "big business." In 1968 Conley (1973) estimated the value of all resources used for residential care of the retarded, including public

and private institutions, residential schools and other private facilities totaled under $1 billion ($998,474,000) and exceeded $1 billion in 1970 ($1,268,233,000).

Through periodic surveys of public residential facilities, Scheerenberger (1979) has estimated the growth of PRF budgets from $.5 billion in 1970 to over $3 billion in fiscal year 1978-1979. The differences between Conley and Scheerenberger are due to differences in timing of surveys, the methods used in arriving at estimates, and the type of variables included in the estimates. Conley included capital investments, volunteer labor, and resident labor, while Scheerenberger did not.

The estimate of over $2.7 billion in expenses made in this study is in agreement with Scheerenberger's figures. Scheerenberger stated that the $3 billion figure for fiscal year 1979 should be accepted as only a minimum estimate that covers direct expenses for variable items such as personnel and other operating expenses. The detail of questions used in the mail survey long form of Scheerenberger are limited to total operating costs (personnel, other, capital), capital construction, and per diem. The long form was completed by 174 facilities in 1979. A short form survey was completed by 104 facilities and contained questions about total operating budget and per diem only. The interview survey used a more detailed revenue and expense statement for fiscal year 1978 and was completed by all 236 of the sampled facilities.

As presented in Table 4.3, the total revenue of public and community residential facilities in 1977-78 exceeded $3.11 billion. The

growth in total revenue from 1970 to 1978 for public residential facilities is similar to the indicators reported for the entire health care industry including nursing homes. Public residential facilities are virtually completely supported by government funds (98%). Of the $2.6 billion invested by government levels in public residential facilities, $1.9 billion was contributed by state governments, but these figures probably include some federal dollars. The federal contribution of $643 million is undoubtedly an underestimate of what states received because the facility respondents might not be informed of the actual federal participation level. Regions and county levels of government apparently do not make significant financial contributions to the costs of public residential facilities. Similarly, the other sources of revenue (resident/family and contributions) account for approximately 2% of the total sources of revenue.

In contrast to public residential facilities, the revenues of community residential facilities (Table 4.2) come from a more balanced array of sources. For example, federal ($125 million) and state participation ($120 million) are followed closely by resident/family contributions ($93 million). Overall, government support is 72% of all revenue with the remaining 28% coming from resident/family contributions (20%), and donations (8%). The public residential facility total revenue of $2.6 billion is five times greater than the community residential facility revenue of $484 million. It is important to note that while the total number of residents served is only 2.5 times greater in PRFs than CRFs, the level of dependency among residents is

much greater in PRFs than CRFs. This factor is especially important to consider in evaluating cost data, since the level of dependency has been found highly correlated with cost of care in other long-term care studies (Piasecki, et al., 1977; Primrose, 1972). In addition, the public residential facilities almost always included day programming costs while approximately 25% of the CRFs included such expenses.

The regional patterns of PRF and CRF revenue (Tables 4.11, 4.12, and 4.13) are similar to other studies in this area. The Northeast region had the highest reported revenue. This regional trend has been reported in earlier studies (Baumeister, 1970; Krantz, Bruininks, & Clumpner, 1978; Scheerenberger, 1978b, 1979) as well as in other human service studies such as the National Nursing Home Study (NCHS, 1979).

The patterns of revenue described in this study offer a comparison between public policy intent and fiscal incentives at a federal level. In its Report to the President, the President's Committee on Mental Retardation (1976) recommended that the federal leadership role in deinstitutionalization should continue:

> The federal government should provide financial assistance to the States to cover costs of transition of individuals from institutional to community services, and costs of transforming or replacing central institutions for more functional purposes consistent with the needs of retarded citizens. (p. 134)

As this study has shown, the financial burden of maintaining residents in public residential facilities falls predominantly to the states and federal government while the financing of community residential facilities shifts more to local government resources in tandem with increased contributions from residents/families and charity.

Several authors have noted that federal and state funds tend to finance care provided in the more intensive and expensive settings of public residential facilities. Unfortunately, given limited money, few resources may be left to expand alternatives in the community. The intent of deinstitutionalization may remain at the rhetoric stage given the impact of federal fiscal disincentives to use community based alternatives.

Bradley (1978) inquired whether "services are organized in response to federal funding mechanisms at the risk of not meeting the intent of deinstitutionalization and more importantly the needs of the people to be served?" (p. 32). For example, the availability of Title XIX funding was cited by a Department of Health, Education, and Welfare Special Task Force on Deinstitutionalization as "offering a strong incentive toward institutional care of the disabled" in opposition to the federal posture of placing mentally retarded people in the least restrictive environment (p. 6). Currently, states may be inclined to renovate and upgrade public residential facilities to comply with standards for Intermediate Care Facilities for the Mentally Retarded necessary for Title XIX funding. At the same time, however, states are urged to reduce the number of mentally retarded residents in public residential facilities. The policy intent is thus thwarted by the fiscal incentives as noted by the National Association of State Mental Retardation Program Directors report (1980):

> Because the present federal ICF/MR rules require a facility to comply with complex programmatic, environmental and life safety standards in order to maintain its Title XIX certification, some observers have expressed concern that compliance-

> related expenditures in the states--both in terms of personnel costs and capital improvements--is siphoning off the fiscal resources necessary to initiate community-based residential and daytime programs. In addition, they are worried that the capital construction dollars required to renovate and modernize buildings on the grounds of large, existing state institutions which lock the states into a long-term commitment to an institutional model of services--a model which many professionals now argue is outmoded and counter productive. (pp. 29-30)

The implications for federal policy makers will be discussed more thoroughly in Chapter VI.

Expenses

The total payroll expenses for PRFs (Table 4.4) was $2.165 billion or 79% of the total expenses of $2.7 billion. This proportion is identical with that reported by Scheerenberger (1978a) for PRFs in the United States. The total capital expenses of $141 million are much lower than the estimated $278 million for capital outlays as reported by the National Association of State Mental Retardation Program Directors study (1980). The difference of $137 million can be attributed to methodological difficulties in gathering information from states which appropriate capital outlays for two or three years. The researchers of the National Association of State Mental Retardation Program Directors divided capital outlays equally in instances of multiple reporting years. The data from this survey were collected for a sample of facilities during a single reporting period and probably represent a reasonably accurate picture of how individual facilities depreciate capital costs over several years.

All other expenses are comprised of costs other than those for labor (personnel) which tend to vary because they depend on the level of output or services provided during a specified time period such as the fiscal year. Included are items such as food, drugs, supplies, laundry and linen, utilities, and other expenses. Table 4.4 shows that 16% of PRF expenses or $428 million went toward these types of items. Scheerenberger (1978a) estimated $607 million (20%) was spent during fiscal year 1978-1979 for all other expenses (p. 21).

As presented in Table 4.5, the payroll expenses of CRFs accounted for 52% of the total operating expenses or $268 million of the $518 million total. This proportion for payroll supports other findings including Piasecki et al. (1977), Indiana Department of Mental Health (1975), and O'Connor and Morris (1978) who reported proportions of 50%, 53.2%, and 58%, respectively. Peat, Marwick, Mitchell & Co. (1976) has interpreted the differences between PRF and CRF payroll expenses as the constant rate of underpayment on the part of CRFs for professional and paraprofessional staff.

The breakdown of capital expenses estimated at $60 million (12% of total) and all other expenses estimated at $194 million (36% of total) seems to corroborate the patterns of smaller studies reported above.

Capital Investments

In 1973 Conley observed that there was little national information on which to estimate the fair rental of land, buildings, and equipment used for the residential care of mentally retarded people. As a result,

Conley noted, "This element of cost is almost always omitted from operating expenditures since these assets are usually owned by the state or operating agency rather than rented" (p. 103).

Conley estimated the total value of capital investments for public and private institutions in 1968 was $3.2 billion. In order to arrive at this estimate Conley relied upon a 1965 study by the California Department of Mental Health which estimated the replacement cost of an average bed in a state institution was $15,000. The average per capita capital investment of private residential facilities was based on figures for mentally ill people. The 1968 average per person cost was $9,000.

Beyond Conley's estimates, little has been reported in the literature on this topic since 1973. The National Association of State Mental Retardation Program Directors (1980) recently completed a survey of state officials on the anticipated capital outlays for a 3-year reporting period. The median per person capital expenditure during this time was $5,460.

Tables 4.7, 4.8, and 4.9 presented the reported estimates of capital investments for public and community residential facilities. The combined total of $5.3 billion for land, buildings, and equipment is almost twice as much as Conley's estimate for a decade ago. An additional $576 million can be attributed to the appraised value of equipment and furnishings. No estimates of land holdings of PRFs and CRFs could be found in the literature. The approximate number of acres for PRFs is 12,359 and 3,441 acres for CRFs.

Locational Factors and Cost

Census Regions

Public residential facilities like nursing homes show regional variation in their revenues and expenditures due to general cost of living differences or to differences in the supply and demand of one or more factors of production (labor, capital, materials). Similar to the National Nursing Home Study and the U.S. Bureau of Census reports on institutionalized populations, the per diems of public residential facilities were substantially higher in the Northeast than in any of the other regions. Personnel expenses were identified in the nursing home study as the major factor contributing to this variation. As shown in Table 4.13, the Northeast region reported the highest payroll expenses totaling $76.1 million compared to North Central ($557 million), South $546 million), and West ($295 million). The regional differences have also been reported by Baumeister (1970), Krantz, Bruininks, & Clumpner (1978), and Scheerenberger (1978a, 1979).

Metropolitan Location

Unlike previous reports of differences in per diems of halfway houses and nursing homes located in rural and urban areas (Piasecki et al., 1977), the current study found no differences among the types of location. Piasecki and associates reported that facilities for psychosocially disabled people located in rural areas tended to have significantly higher per diem costs ($18.33) than urban-downtown facilities ($11.21). In contrast, the results of this study found that both

public and community residential facilities located on an urban fringe cost less than either a central city or rural location, but not significantly less. Both public and community facilities located in major urban areas cost more than facilities in rural areas.

Whether location affects cost probably depends upon the purpose of the facility. If the objective of a community residential facility is to offer domiciliary care only, then the difference in cost between a rural and urban location is dependent upon cost of living differences. On the other hand, if extensive services are needed by residents, location may affect the access and use of existing generic agencies by residents.

Organizational Factors and Cost

Size

The size or number of beds in health care facilities is frequently used as a rough indicator of the supply of care. The underlying assumption is that there is a strong relationship between the number of beds and other service characteristics such as building space, equipment, personnel, and other factors used in providing services.

Sociologists have attempted to ascertain whether size is the key to understanding what happens in an organization or whether size is insignificant compared to other organizational factors (Hall, 1972). There are several ways to measure the size of an organization (number of employees, number of students, number of stockholders number of clients) and these measures have been found to be highly correlated and

interchangeable (Anderson & Warkov, 1961). Pugh, Hickson, Hinings, and Turner (1969) analyzed 46 English organizations and assessed the number of employees and the net assets of the organizations. A high correlation (.78) was found between the number of employees and the net assets. Thus, large organizations are large in terms of membership and resources. Pugh et al. concluded that size:

> causes structuring of organizations through its effect on intervening variables such as frequency of decisions and social control. . . . Large organizations tend to have more specialization, more standardization, and more formalization than smaller organizations. (p. 98)

Traditional economic theory postulates a U-shaped relationship between average costs and size. Theoretically, as the scale of production expands over the lower range of output, certain economies (e.g., quantity discounts, full use of labor and equipment) are realized resulting in decreasing average costs of production. After some point, the extra costs associated with larger size contributes to a reversal in the economy of scale. Knapp (1978) attributed the increase in average cost to "the strain of over-use of some of the equipment and buildings, increased maintenance costs, and difficulties encountered in the administration of the caring services" (p. 32).

Although Baumeister (1970) reported that smaller institutions had higher per capita costs than larger facilities, relatively little is known about economies of scale in residential services for mentally retarded people. As described earlier in the review of literature, the evidence presented in cost studies of hospitals is often conflicting and confusing.

The results of correlating size and per diems of PRFs and CRFs resulted in mixed findings. The size of PRFs was negatively correlated ($r = -.12$) but not at a significant level. On the other hand, the size of CRFs was positively correlated with per diem ($r = .22$) which was significant ($p < .005$), but rather low in magnitude.

Table 4.10 presents a comparison of per diems by size categories. Smaller PRFs with fewer than 500 residents reported the highest per diem ($60.05). The lowest per diem ($41.68) was reported by the next largest group of PRFs with 500 to 999 residents. The per diem escalated again for PRFs between 1,000 to 1,599 residents ($47.81) and then went down slightly ($46.82) for the largest facilities.

The per diems of CRFs are also reported in Table 4.10. A positive linear progression was shown with the smallest facilities reporting the lowest per diems and the larger facilities reporting progressively higher per diems.

The positive relationship between size and per diem in CRFs was probably due in part to the greater number of services that larger facilities tended to offer. The additional cost associated with a broader range of services probably overshadowed efficiencies.

Size and per capita budget figures were reported by Baker, Seltzer, and Seltzer (1977) who reported that small group homes (6-10 residents) were twice as expensive as large group homes (21-40 residents). There were 86 small facilities and 12 larger facilities in that sample which could explain some of the variation. O'Connor and Morris (1978) found that size was significantly related to capital costs only.

Johns, Chapman, and Raphael (1976) have suggested that "precisely determining economy of scale is probably futile at this stage of knowledge" (p. 78). In order to determine whether economy of scale exists, cost and output behavior for affected providers have to be known for prior periods. Average variable costs are then projected over different ranges of output. Johns and associates caution, however, that "even if data were available for this purpose, cost estimates are yet again tenuous, for cost changes in response to anticipated competition may occur even as the agency is performing the analysis" (p. 78).

Staff Turnover

Zaharia and Baumeister (1978) estimated the average replacement cost of $1,562 for technician positions at three state-operated institutions. The majority of the cost (84%) was expended on training replacement staff members. In a similar study of community residential facility house managers, George and Baumeister (1979) estimated the average replacement cost of $379 for a house manager with training costs equal to 20% of the total amount. In addition to these overhead costs, Zaharia and Baumeister propose that there are programmatic costs associated with disruption in services due to turnover. It has been virtually impossible to calculate these programmatic costs.

The results of this study did not find any significant differences in per diem rates as a result of staff turnover in either community or public residential facilities. The type of cost analysis needed to

determine how turnover affects both program and overhead costs should probably be conducted at the individual organizational level as suggested by Zaharia and Baumeister.

Staff-Resident Ratio

There are several difficulties in attempting to separate causal explanations from statistical explanations in cost analysis studies. Do resident characteristics determine an organization's services which determine the level of staff-resident ratio, or do the staffing patterns and ratios determine which residents will be served by a particular facility? A satisfactory resolution of cause and effect of factors cannot be reached in this study. Nevertheless, staff-resident ratio has been found to be the most highly correlated factor with cost ($r = .74$) in the O'Connor and Morris (1978) study of group homes in federal Health and Human Service Regions IX and X.

Public residential facilities that had a staff-resident ratio of .66 to .99 reported per diems of $44.66 while public facilities with a staff-resident ratio of 1.00 to 1.32 reported a per diem of $54.00. The highest per diems were reported by facilities with staff-resident ratios of 1.33 or greater. Community facilities generally reported a similar pattern.

There is a slight decline in per diem rates of community residential facilities when the staff-resident ratio exceeds 1.33. The decrease in per diem can be attributed to several organizational characteristics which suppress the effects of higher staff-resident ratios. These specific facilities usually serve adults only and tend to be staffed

by direct care staff only who offer domiciliary care only. The adult residents of these facilities tend to be either mildly or borderline retarded.

As described earlier, personnel expenses account for over 75% of PRF budgets and over 50% of CRF budgets. It would appear that there is an expected relationship between adding employees and the increases in operating expenses, particularly in labor intensive industries such as residential facilities.

Index of Staffing/Services

Costs have been found to vary substantially in residential facilities to the extent that particular residents require more specialized or intensive services (Primrose, 1972; Indiana Department of Mental Health, 1976; Mayeda & Wai, 1975; Jones & Jones, 1976; O'Connor & Morris, 1978). In particular, community residential facilities in this study represented a broad range of purposes and concomitant staffing and service arrangements. O'Connor and Morris (1978) characterized this range of roles as follows:

> At one end of the continuum, the purpose of the facility is to have a heavy programmatic orientation and provide a strong skill training program. The other end of the continuum suggests that a CRF should function as a home environment, providing the warmth and support of "significant others." (p. 25)

The amount of money spent on training residents ranged in the O'Connor and Morris study from $0 to $190 per month.

As described earlier, community residential facilities in this study were categorized according to an index of staffing and services

proposed by Piasecki et al. (1977). Significant differences were reported among the levels of this index with facilities operated by direct care staff only reporting the lowest per diem ($11.85). As the number and type of staffing/service levels increased, the per diem also increased to a high of $31.47. This finding confirms similar results reported by Piasecki et al. (1977) for halfway houses.

Occupancy Rate

Substantial variation in occupancy rates should have important consequences in cost because per diem is calculated on the basis of the number of residents (Peat, Marwick, Mitchell & Co., 1976; Piasecki et al., 1977). Piasecki and associates reported that if there were a substantial number of empty beds in nursing homes and halfway houses, there were higher per day per resident costs. Similarly, Peat, Marwick, Mitchell & Co. estimated an average of $3.00 per day difference between a facility operating at 100% occupancy and 90% occupancy. Public residential facilities with 90% occupancy reported per diems that were almost $10.00 greater than those with 100% occupancy. On the community residential side, the per diems at 90% occupancy were approximately $2.00 higher than facilities with 100% occupancy. As the number of mentally retarded people who leave public residential facilities increases, the differences between occupancy levels will widen even more, representing important consequences for public expenditures.

Ownership

Is there a relationship between proprietary status and economic efficiency? Anthony and Herzlinger (1975) operationalized the differences in organizations in terms of the administrator's goals, purposes, and decision criteria. Newhouse (1970) suggested that because there is no profit motive, nonprofit hospital administrators make decisions in terms of improving the prestige of an institution as measured by the quantity and quality of services delivered. Administrators of nonprofit hospitals strive for bigger and better facilities and resources. Newhouse portrays this built-in drive as the need to expand size and complexity under the rubric of improving the quality of care. Inefficiency and cost overruns occur because of third party payments and philanthropic contributions remove potential budget constraints.

Proprietary organizations, on the other hand, are usually run by managers whose decisions are guided by the intention of increasing profits while minimizing expenses. Efficiency is implicit in the profit motive.

Community residential facilities were divided according to three types of ownership patterns: 1) proprietary, 2) nonprofit, and 3) family run. There were no government owned and operated CRFs selected in the sample. Public residential facilities were excluded from this analysis because of the obvious organizational differences between CRFs and PRFs. Family run facilities were included as a type of ownership because, according to the respondents, these facilities

do not easily fit into either of the other categories. In terms of organizational structure, a family run facility does not employ any outside staff and is totally owned and operated by family members. A family run facility does not have tax exempt status from the Internal Revenue Service. Such facilities also do not consider themselves as proprietary facilities since their per diems do not contain a profit margin. Accounting is usually not formal in family run facilities. Repeatedly, respondents from family run facilities emphasized that they "spent money until it ran out and they always spent more than they received to care for the mentally retarded residents." Indeed, the results support this contention, since family run facilities operated at significantly lower rates ($12.56) compared to proprietary ($23.21) and nonprofit homes ($24.16). These results support the findings of the nursing home study which found proprietary facilities operating slightly lower than nonprofit facilities, although this difference was not significant.

System Membership

Another phenomenon that has not received adequate attention in the literature is the development of residential facility "chains" or systems of facilities operating under a general ownership or parent organization. In the hospital literature, Lee (1971) has argued that the rapid growth of hospital chains stems from the needs of administrators to behave as conspicuous producers.

In sociology, there has been "very little research on the growth of organizations" (Hall, 1972, p. 134). Starbuck (1965) has proposed

a framework of motivations to explain why growth is important to administrators:

1. Organizational self realization (trying to accomplish better what the organization is attempting to do)
2. Adventure and risk (the desire for new experiences)
3. Prestige, power, and job security
4. Executive salaries (salaries rise exponentially as organization size increases)
5. Profit
6. Costs
7. Revenue
8. Monopolistic power
9. Stability
10. Survival (p. 454)

Starbuck has suggested that growth is often not an end in itself but is a means of attaining other goals or is a side effect of such attainment. The results of this study indicate that systems of CRFs operate at significantly higher cost ($22.75) than nonsystems ($17.72). The nonsystems, however, include family run facilities. However, it does not appear from these data that economies are achieved by expansion in the number of facilities operated under system ownership. Further examination of this issue, holding other factors constant, appears necessary before any conclusions can be drawn.

Number of Years in Operation

Residential facilities which are open for a short period of years experience disproportionate costs due to start up expenses. According to Piasecki et al. (1977), the initial costs for beginning a group home may equal or surpass the annual budget for operating the program. Among the expenses during the beginning years, Piasecki et al. (1977) enumerated the following:

> building rent and rent deposits, mortgages, incorporation and related legal fees, remodeling to meet building code standards or program requirements, personnel recruitment and training efforts, rent or purchase of furnishings and consumable supplies, professional services, and community relations efforts. (p. 13)

In analyzing the initial costs of halfway houses and nursing homes, Piasecki and associates noted that significant economies can be realized if physical plant requirements are minimal and existing community resources and services can be used. However, the greater the intensity of services, the greater the initial costs.

The results of this study indicate that public residential facilities which were opened from one to six years ago had a significantly higher per diem, $72.28, than all other categories. This finding confirms Piasecki's observations since these facilities were smaller in scale (100-200 beds), had more stringent physical plant requirements necessary to meet Intermediate Care Facility for Mentally Retarded Standards, and provided intense levels of service, including medical care.

Community residential facilities did not exhibit the wide variability in per diem by the number of years in operation. The older facilities tended to be large residential schools which reported higher per diems than more recently opened facilities which offered domiciliary care only.

Resident Factors and Cost

Age of Residents

O'Connor and Morris (1978) reported a high negative correlation between cost and age of residents ($r = -.61$). Younger residents cost twice as much as adults, according to O'Connor and Morris. Almost all public residential facilities have admission criteria which allows people of all ages to reside in the facilities. Some variability was evident in per diem rates of public residential facilities, but the differences were not significant. Children's facilities reported the lowest per diem at $36.00, while facilities serving all ages reported per diems of $52.58. On the other hand, community residential facilities in this study reported per diems that showed significant differences. Facilities for children reported per diems of $24.74, while adult facilities operated at a per diem of $18.39. The staffing ratio needed to care for children would probably account for the bulk of this difference.

Number of Levels of Mental Retardation

Case mix or the range of cases served has received considerable attention in hospital cost studies. It has been proposed that the wider the range of services or output provided by a hospital, the greater the cost. Lave, Lave, and Silverman (1972) found that hospitals treating relatively large proportions of unusual cases had higher costs. Residential facilities for mentally retarded people may serve a similar "mix" in terms of the number of different levels of mental retardation.

Some facilities may serve only one level of retardation while other facilities may serve all four levels. According to the results of this study, there were no significant differences in the mix or number of levels of mental retardation in either public or community residential facilities.

Community residential facilities reported higher per diems when all four levels ($23.07) of mental retardation were served when compared with facilities serving one level only ($17.85). The difference was not significant, however. A more refined measure of case mix may be necessary in future research studies to test whether a relationship exists with cost.

Proportion of Severely or Profoundly Mentally Retarded Residents

As described in an earlier section on staffing and services, costs have been found to vary substantially in residential facilities to the extent that particular residents require more specialized or intensive services (Primrose, 1972; Indiana Department of Mental Health, 1976; Mayeda & Wai, 1975; Jones & Jones, 1976; O'Connor & Morris, 1978). According to O'Connor and Morris (1978), "the most difficult variable to categorize facilities on was IQ and level of functioning of the residents. . . . Further, on the whole, the heterogeneity within facilities was as great or greater than between facilities" (p. 41).

Heterogeneity of IQ appears to be a prevalent pattern among community residential facilities as contrasted with public residential facilities. For those community facilities which served no or less than one-half severely or profoundly retarded residents, the per diem

costs were significantly lower than facilities which were predominantly serving the same type of residents. Resident characteristics must be considered interrelated to the type of staffing/services offered as well as the staff to resident ratio needed to provide the necessary level of programming. This combination of factors probably influenced the variation in per diem rates.

In comparison, public residential facilities which served all severely or profoundly mentally retarded residents had a substantially higher per diem ($58.68) than those public facilities serving fewer than 75% of the same type of resident ($46.86). The difference was not significant, however.

Cost Function Analysis

Discussion of the regression outcomes is an extension and elaboration of the multiple relationships presented to this point. Cost function analysis allows for a greater understanding of the interrelationships that exist among and between predictors and the dependent variable, cost of care.

Public Residential Facilities

Table 4.62 presented the results of a stepwise, multiple regression with per diem cost of public residential facilities defined as the dependent variable. Over 47% of the variance (multiple R = .69) in per diem was accounted for using this equation. This outcome is quite comparable to Piasecki et al. (1978) regression analysis for nursing homes which accounted for 44% of the variance (multiple R - .67). In all,

thirteen factors comprised the final equation which had an overall significance of $p < .005$. The variables are presented in decreasing order of F ratios in Table 4.62.

The single factor consuming the greatest amount of variance was staff to resident ratio ($R^2 = .24$) which is an identical finding of Piasecki et al. (1978) analysis of halfway houses. Personnel expenses were reported earlier as the single largest expense consuming 79% of the overall budget of public residential facilities. These two findings are consistent.

Location in the Southern census region was the second most important factor in accounting for variance, and was negatively related to per diem cost. A similar finding was reported for both halfway houses and nursing homes by Piasecki and associates (1978). Newer facilities tended to have higher per diems than facilities in operation for several years. The number of operating years accounted for an additional 4% of the variability. Facilities which served only adults were negatively correlated with per diem ($r = -.11$) and accounted for 6% of the variability.

Once these variables have been introduced, the amount of residual variation explained by the remaining nine factors was less than 4%. The underlying dimensions of the first four critical factors are a) staff to resident ratio, b) geographic location, c) number of years in operation, and d) age of resident served.

Community Residential Facilities

As a means of comparing the effectiveness of this same set of factors on the per diems of community residential facilities, a similar regression analysis was performed with the results reported in Table 4.64. The overall significance level ($p < .05$) was much higher than the significance level for public residential facilities ($p < .005$). Nine variables were included in the final equation for community residential facilities, four fewer than the equation for public residential facilities.

The single factor which accounted for the greatest amount of variability in per diem cost was the proportion of residents who were severely or profoundly mentally retarded. As noted earlier, community residential facilities serve a broader range of levels of mental retardation than public facilities that predominantly serve the most severely handicapped residents.

Staff turnover was the second most important factor (R^2 change = .15) which was negatively correlated ($r = -.22$) with per diem. In other words, as per diem costs increase, turnover decreases. It is interesting to note that turnover produces no appreciable correlation ($r = .03$) with the proportion of severely or profoundly mentally retarded residents served.

The third factor to show some minor importance in accounting for variability (R^2 change = .04) was the size or number of residents served. Size is negligibly correlated with the first two critical factors: proportion of severely or profoundly mentally retarded ($r = .13$) and turnover ($r = -.06$). The largest residential facilities are also the oldest and often provide residential school services.

Metropolitan location and staff to resident ratio each account for approximately 3% of the remaining variability. In public residential facilities, staff to resident ratio was a much more significant factor in explaining variability of per diems, while metropolitan location occupies a similar position in both equations. Higher per diems are reported by facilities located in urban areas and by facilities with higher staff to resident ratios.

Perhaps the first factors entered in both equations is a reflection of the respective sensitivity displayed by the indicators. However, common to both the factors of staff to resident ratio and proportion of severely handicapped residents is an underlying dimension of organizational responsiveness to resident characteristics. On the public residential facility side, this responsiveness is reflected in staff to resident ratio while on the community side, it is best expressed by the proportion of residents who are severely or profoundly mentally retarded In summary, the regression analysis of community residential facilities revealed a different set of variables influencing per diem including: a) the proportion of severely or profoundly mentally retarded served, b) staff turnover, c) size, d) metropolitan location, and e) staff to resident ratio. These findings partially support the results of a regression analysis performed on 29 community residential facilities performed by O'Connor and Morris (1978). They reported that the first factor, which was related to both operating costs and total costs, was "a combination of staff to resident ratio, degree of programming, and age of residents" (p. 58).

As described in Chapter IV, a supplementary cost function analysis was performed on the data of community residential facilities in order to include several variables which were unique only to the community sector. This supplementary analysis was presented earlier in Table 4.66.

This supplementary analysis was much more effective in accounting for variability than the use of the common set of predictors: multiple R = .62 and .49, respectively.

The first and most important factor in the supplementary regression analysis was the index of staffing/services which consumed as much variability as the entire first equation (multiple R = .48, R^2 = .23). As shown in Table 4.65, the index of staffing was positively correlated with size (r=.53), number of operating years (r=.36), and negatively correlated with family ownership (r= -.59), and proprietary organizations (r= -.40). There is a moderately high positive correlation between the index of staffing/services and per diem (r=.48). The use of an index for staffing/services was introduced by Piasecki et al. (1977) who also reported "a significant contribution to per diem costs is attributable to the staffing index" (p. 41).

Another supplementary factor included in this analysis was family ownership and operation which was found to be the second most important factor in accounting for an additional 4% variability. As described earlier, family owned and operated facilities tend to operate at significantly lower rates than either proprietary or nonprofit organizations. The remaining factors are closely related to the order of appearance in the first regression equation with proportion of severely or profoundly

mentally retarded residents followed by staff turnover, metropolitan location, and staff to resident ratio.

In summary, the most critical factors revealed in this supplementary analysis were a) index of staffing/services, b) family ownership, c) proportion of severely handicapped residents, and d) staff turnover.

The regression models used in this study did not explain all the variance present in cost per diems of public and community residential facilities. Cohn (1979) noted two reasons accounting for this type of outcome. First, the nature of critical inputs may often be environmental or historical which are difficult to quantify. Second, inputs cannot always be priced once they are defined. For example, in educational production functions, staff constitute the largest single input variable measured by educational level or salary. A preferred proxy for staff would be a refined measure of both the quantity and quality of services rendered. The current study could be improved through refinement in the variables selected for the model particularly in the area of quantity, quality, and mix of services provided; the allocation of capital costs to output; the characteristics, needs, and programming requirements of residents; the overall output or number of residents in average daily attendance; and a throughput measure consisting of the number of admissions, readmissions, releases, respite care stays, and evaluation cases.

The use of cost functions assumes cost minimizing behavior on the part of the administrators or organizations participating. The cost data used in this study may reflect cost maximization rather than cost

minimizing behavior. In nonprofit organizations, the goal of improving services might mean pouring limitless funds into a bottomless receptacle. Those facilities which are private residential schools may be able to attract resources disproportionate to their size or services simply because they are more prestigious.

In contrast with the long run cost assumptions that an organization will change its size in response to the drive for economy of scale, the facilities in this study maintain certain size levels as a function of social values and treatment philosophy. In some states small is beautiful and regulations govern the allocation of resources to group homes that emulate a typical family setting. It would seem plausible and highly desirable in future studies to use a more refined typology of residential facilities rather than the gross distinction between public and community residential facilities. The wide variation in facilities under these headings may be due to different abilities or motivations to minimize costs of production and unequal prices or factors that affect efficiency.

Finally, the application of the regression equations derived in this study to new sample cost data will probably result in shrinkage of the multiple correlations. As described by Kerlinger and Pedhazur (1973), shrinkage occurs because of sampling errors, errors due to intercorrelations among predictors, high ratios of independent variables to sample size, and intercorrelations among predictors with the criterion. In order to estimate the degree of shrinkage, cross validation of the first sample results with a second sample is preferable. However, cross validation was beyond the scope of this study and was not performed.

VI. IMPLICATIONS

The overall purpose of this study was to examine the relationship between the public policy of deinstitutionalization and the costs of public and community residential facilities. The outline of this chapter will begin with a general evaluation of deinstitutionalization as a public policy, followed by a summary of the major findings and the policy implications of findings from this study. The final section of this chapter will contain a discussion of the limitations of this study as well as an outline of future research implications.

Evaluation of Deinstitutionalization as a Public Policy

Several recent publications have placed increased emphasis on public policy analysis through the use of evaluation theory and practices. Simply stated, policy analysis is "finding out what governments do, why they do it, and what difference it makes" (Dye, 1976, p. 1). According to Jones (1977), public policy is developed by means of three major phases: 1) problem identification, 2) program development, and 3) program implementation. The need to deinstitutionalize mentally retarded people from public residential facilities was perceived, defined, and organized by executive orders from Presidents Kennedy and Nixon, based on pressure from interest groups concerned with the welfare of mentally retarded people. Demand for change was intensified by the

civil rights movement of the 1960s, changes in special education practices, and the spillover effects from the deinstitutionalization movement of mentally ill people. Finally, a national goal was set in 1971 for the movement of one-third of 200,000 institutionalized mentally retarded people from state institutions to community alternatives. Table 1.1 presented a more detailed description of each of these important events that constituted the problem identification stage.

During the 1970s, the second phase of the public policy process occurred. Program development occurred through passage of major pieces of legislation, including amendments to the Social Security Act which authorized Title XIX funding for intermediate care facilities and established the Supplemental Security Income program. Several landmark decisions established constitutional rights of mentally retarded residents in relatively large public residential facilities (Wyatt v. Stickney, 1972; Welsch v. Likens, 1974; U.S. v. Solomon, 1974). The Title XX amendments to the Social Security Act and the Developmental Disabilities Bill of Rights Act also established deinstitutionalization as a national policy.

Program implementation also occurred during the 1970s as demonstrated by the movement statistics presented earlier in Figures 1 and 2. The population of mentally retarded residents in public residential facilities steadily declined from the peak population of 194,650 residents in 1967 to the 1979 population of 139,400 residents (Schoenberger, 1979). The number of CRFs grew exponentially during this same

period. Organizationally, developmental disabilities councils were established in every state to be responsible for preparation of plans outlining community alternatives to institutionalization.

The next cycle in the evaluation process outlined by Jones (1977) consists of assessing the merits of the public policy of deinstitutionalization by a) specification of its objectives, b) measurement of these objectives, c) analysis of data, and d) proposing changes, adjustments, or redefining the problem.

Accepting the public policy of deinstitutionalization as the independent variable and the economic results as presented in this study as the dependent variable, one can examine questions such as, "What is the gain or loss from the distribution of burden on government levels when deinstitutionalization occurs?" In this manner, research can be "used in reconceptualizing the character of policy issues or even redefining the policy agenda" (Weiss, 1977, pp. 15-16).

An evaluation posture has been proposed in the past by government officials but was unattainable due to lack of relevant information. In a paper presented at the National Conference on Social Welfare in 1975, Thomas asked, "How far and fast have we come in deinstitutionalization?" Answering his own question, Thomas stated:

> I do not think it is yet possible to evaluate, on a national basis, what the successes and failures of recent efforts to deinstitutionalize have been, although we obviously do know many of the mistakes. In my mind they boil down to over emphasis on saving tax money in the short run at the expense of vulnerable individuals; under emphasis on the creation of high-quality, flexible, community based alternatives; and a general tendency to lose sight of the whole point of the undertaking. (pp. 6-7)

In the long run, Thomas (1975) asserted, "anything which more effectively responds to human needs is cheaper than its predecessor" and deinstitutionalization attempts to meet such needs in a humane, normalizing approach.

Although final conclusions about the evaluation of deinstitutionalization as a public policy may be premature, it seems plausible to outline a few brief implications of this study.

Summary of Major Findings and Public Policy Implications

Constitutional Guarantees and Level of Funding

In 1970, Conley (1973) estimated that the total expenditures for residential care for mentally retarded people exceeded $1 billion. In less than ten years, that amount has more than tripled, according to the results of this study. The growth in dollars parallels the entire health care industry including nursing homes. Moreover, during the past decade, three major policy premises have been advanced which affect the financial status of deinstitutionalization including: a) mentally retarded residents who are committed to state institutions have a right to treatment, b) the treatment should occur in the least restrictive environment, a principle that serves as the foundation for development of community alternatives, and c) treatment should occur primarily at public expense.

The U.S. Supreme Court is currently reviewing several recent federal court decisions involving the closing of institutions and placement of residents in community facilities. However, government sources

continue to finance long term residential care with a higher proportion of support given to public residential facilities (98%) in comparison with community residential facilities (72%) as presented in this study. The expenditure of billions of dollars to residential care provides evidence of state and national commitment to the long term needs of mentally retarded people.

An emerging policy issue for the coming decade is the impact of deinstitutionalization on the costs of special education in public schools. The right to a free and appropriate education is assured by federal law PL 94-142 and the equal protection clause of the 14th Amendment to the Constitution. According to Marinelli (1975) the equal protection clause means "equal access to differing resources for differing objectives based upon individual need and potential" (p. 248). The direct implication for states and local districts is that equal educational opportunities will require differing amounts of money for each handicapped child. For example, in 1972-1973, less than 60% of all eligible children were receiving educational services due to inadequate resources. Kakalik et al. (1973) estimated the total expenditures for public education was $2.7 billion in 1972. He further estimated that if all eligible students were appropriately served during that year, the cost would have risen by $2.5 billion.

Changes in the residential placement of children will have direct impact on the special education financing. As individuals with low incidence levels of severe or profound mental retardation are discharged into community settings and are served by public schools, local district

officials will be forced to create new programs to meet these needs. Marinelli (1975) projected that states will also be required to:

> assure that there are adequate funds for the education of handicapped children so that a parent or guardian is not charged for the cost of a child's education. To accomplish this, the states may have to increase their budgets for education, reallocate current levels of funding within the total educational budget, or combine the above, and carefully examine how efficiently current allocations of resources are being consumed. (p. 253)

One of the most crucial factors in special education financing is programming since different educational programs have significantly different costs. It is accepted that special education programs designed to meet the complex needs of multiply handicapped students will require additional specialized personnel. The need for additional personnel implies greater personnel costs and increased total costs. In addition to personnel costs, there are several other factors that may affect expenditures including the community readiness, availability of support facilities and programs, increased transportation costs, coordination, follow through and case management costs as well as necessary monitoring and licensing requirements. It is anticipated that the potential benefits of shifting educational opportunities from private and public institutions to local public schools have greater significance than the reallocation of dollars from one setting to another. Far greater communication and cooperation between education and human service agencies will be needed during the forthcoming decade in order to meet mandates while best serving individual educational needs of children.

Programming Requirements and the Application of Cost Functions

Whether provided in public or community settings, residential care is a labor intensive business. Personnel costs account for 79% of the total expenses of public facilities and 52% of the total community expenses. The patterns and levels of staffing are dependent upon resident characteristics such as age and level of retardation, as well as the type of services offered in the broad range of residential alternatives. Changes in the level of staff to resident ratio have substantial effects upon the cost of providing residential care in both public and community residential settings.

At the present time, policy makers depend upon implicit and arbitrary judgments regarding combinations of input variables such as staff ratios, size of facilities, and type of programming that will provide care commensurate with individual needs. Program standards and requirements set forth by judicial orders or accreditation councils are often formulated by expert opinion not data based research or results of cost function analysis. Although policy makers control the allocation of inputs, their basic objective relates to the level and mix of outputs. If policy makers do not know how input factors combine to produce outputs, the objectives will not be achieved at minimum cost except by chance. Cost functions can be applied to assist policy makers.

In this study, the factors which were found to significantly influence the per diem cost of public residential facilities include: a) staff to resident ratio, b) geographic location, and c) number of years in operation. Higher costs are reported by facilities with higher

staff to resident ratios, facilities located in the Northeast census region, and by facilities which opened in the last six years. States which have undertaken a policy of decentralization by building smaller, specialized public residential facilities may have chosen a costlier method of caring for mentally retarded people in contrast with states which have used community based alternatives.

Although more research and refinement of cost models is needed, the factors which were found to most significantly affect the per diems of community residential facilities were: a) the level of staffing/ services provided, b) the type of ownership, c) resident characteristics such as age and level of retardation, and d) staff turnover. Higher costs were reported by facilities which are larger and provide a full range of services similar to public residential facilities. Family owned and operated facilities were consistently small operations which offered domiciliary care only and reported significantly lower per diems. Lower per diems were also related to two resident characteristics. Adults were significantly less expensive to serve than children, while individuals who were mildly or moderately retarded were also less expensive to serve than more severely handicapped people. Finally, facilities that reported lower turnover had higher per diems, which suggests that these facilities offer higher payments for personnel.

Cost effectiveness analysis between public and community residential facilities seems futile as the characteristics of each group tend to polarize. Public facilities tend to have different purposes, serve a more dependent population, offer broader and more medically

related services, and have greater capital investments in land, buildings, and furnishings. In contrast, community residential facilities usually represent only one portion of the total cost of services with day programming, transportation, and medical services constituting separate costs. To make the two types of settings equivalent for purposes of comparing costs is virtually impossible.

However, if the current movement of residents from public institutions continues, there will have to be a reallocation of funds to community based alternatives. The overall implication of these findings is that the transfer of severely or profoundly mentally retarded people to community based settings requires the necessary level of funding to provide the required level of staffing and services necessary to meet individual needs. While community facilities may not be as expensive as public residential facilities, it is equally true that up to this time, community facilities have not served the same clientele nor provided the same level of services.

Reimbursement Patterns and Future Development of Community Alternatives

In a recent national survey of state mental retardation coordinators, the majority of respondents indicated that during the 1980s there will be an increase in the number of small Intermediate Care Facilities for the Mentally Retarded (Allard & Toff, 1980). This expansion in community based facilities funded under Title XIX will occur because state planners cite the availability of "uncapped" funding. As cited throughout this paper, the manner of resource

allocation should not dictate the provision of services separate from individual needs nor should inappropriate or inefficient residential alternatives be rewarded. The current piecemeal funding sources for community alternatives should be modified to better address the non-medical residential living requirements of individuals currently served in Intermediate Residential Facilities for the Mentally Retarded.

During the summer, 1980, Senators Bob Packwood, Oregon, and Bill Bradley, New Jersey, introduced a bill in the Senate which would consolidate all community based, long term care and home health care services now handled by Title XVIII (Medicare), Title XIX (Medicaid), and Title XX into a new three-year demonstration program called Title XXI. The purpose of Title XXI, according to the authors of the bill, is to shift from the institutional bias in current programs to a community based approach for both cost and humane purposes (Handicapped Americans Reports, July 3, 1980).

Rather than building programs around reimbursement sources, policy makers should consider projecting costs based upon a four-step framework proposed by Bernstein, Hartman, and Marshall (1976):

1. Determine individual needs and appropriate programming services
2. Determine costs of such programs in community settings
3. Determine the needed levels or amounts of funding necessary to provide the required levels of staffing and services
4. Determine an allocation method to distribute funds to ensure equity for involved individuals and programs.

State policy makers would need an enormous amount of data and technical expertise to use this approach for planning purposes. Rational policy

making is often superceded by political negotiation. For example, determination of costs can occur by three methods. First, there is an empirical approach using historical data to project current and future needs. The drawback of this method is that historical data may not approximate current needs. Past expenditures may be the result of ceilings, political arbitrariness, tradition, or inefficiencies. A second approach is the involvement of experts who use historical data but are able to project what ought to exist and what innovative changes would cost. The disadvantage of this approach is that the choice of experts is subjective and legislators may discount opinions of experts. Finally, levels of funding may be determined by negotiation among various interest groups and the effectiveness of lobbying. The disadvantage of this approach is that the very costly needs of those with more serious and often less socially visible handicaps have been frequently neglected. Although impractical, the four-step framework in planning future changes would assist state policy makers in using economic resources judiciously while balancing the rights and needs of mentally retarded people with an effective and efficient system of residential alternatives (Bernstein, Hartman, & Marshall, 1976).

Limitations

There are five major sources of error in the present study, including a) definition of the population, b) sampling errors, c) measurement errors, d) reporting limitations of respondents, and e) specification errors.

Definition of Population

The present study is predicated on the 1977 national mail censuses of public and community residential facilities conducted by Scheerenberger (1978a) and Bruininks, Hauber, and Kudla (1979). The original definitions used to describe public residential facilities did not include state and county mental hospitals with units for mentally retarded people, while the community residential facility definition excluded generic facilities such as board and care homes or supervised apartments. Moreover, Bruininks, Hauber, and Kudla reported the response rate of the community residential facility survey was 87.9% which introduces biases of unknown proportions about the population frame.

Sampling Errors

The data for this study were collected for a sample of facilities rather than the entire population. The data are subject to sampling errors as presented in Tables D.1 and D.2. Sampling errors are caused from taking a small portion of a population rather than a complete census. The particular subset of the population used in this study is only one of many possible subsets. Estimates derived from this sample group may differ from estimates derived from other groups selected in the same way. As previously described, non-participation by community residential facilities with over 400 residents introduced biases whose effects are unknown. As a result of all of these factors, the financial estimates included in this paper may underrepresent the costs and relationships involving costs within the universe of residential facilities which serve mentally retarded people.

Measurement Errors

All financial data were self-reported figures that were not checked for accuracy through other sources. Self-reported data are subject to an unknown potential for misrepresentation or bias. For example, respondents may have been unable or unwilling to provide correct information. In other instances, imprecise definitions or questions provided in the survey instrument were subject to interpretation. Finally, accounting procedures are not standardized, and this variability in accounting methods could create a potential for error.

Although every effort was made to minimize recording, coding, and processing mistakes, there could have been data handling errors during the analysis stage.

Reporting Limitations of Respondents

Questions assessing the sources of revenue and appraised value of land and buildings are very difficult questions for respondents, regardless of willingness to provide information. The appraised value of land and buildings is a complex issue that had to be handled with the best possible estimates available to financial officers. As discussed previously, the sample facilities may not be the most informed sources about the federal contributions of revenue to states for residential care. As a result, the best estimates of sources of revenue may overestimate the state contributions and underestimate the federal participation.

Specification Errors

The proposed cost function models tested in this study failed to explain the majority of variance in per diems. The model may be limited by an error in specifying all relevant independent variables. This limitation may be a result of erroneous omission of variables or including variables that do not serve as effective proxies. For example, the quality and quantity of services provided by a residential facility has not been defined in the literature nor has there been a refined definition for "case mix" of residents. The only means of avoiding this type of bias is to specify and estimate the model as accurately as possible by including all important variables.

Implications for Future Research

Coleman (1972) urged the development of multiple research approaches to bridge the world of academic discipline with the world of policy and action. Referring to these activities as policy research, Coleman noted that evaluation of social policies required systematic information that had a philosophical and conceptual design that was timely, produced results, and was translatable between the university setting and the world of action.

There are at least three basic directions that future research in the area of cost of public and community residential facilities could take. The first area would involve the establishment of a national data bank for maintaining trend data on the number and movement of mentally retarded people and the costs associated with the residential

facilities serving these residents. The second direction of research would be studies concerned with analysis of factors associated with cost using an inferential approach. Finally, cost models can be designed that allow testing assumptions outside the limitations and constraints of the real world. Models have usefulness for planning changes in direction of public policies such as deinstitutionalization.

Research on Descriptive Trends

The need for systematic national collection of cost information of residential services for mentally retarded people has been reiterated throughout this paper. The type of research studies that could be designed include economic analyses of selected topics at the national, state, and local levels. The growth in expenditures of residential care for mentally retarded people is similar to that experienced by the nursing home sector. This expansion marks the growing importance of planning and evaluation activities related to the long term care needs of this target population.

In-depth interview studies similar to the present study should be conducted at regular intervals in the future. The facilities could be a national random cluster sample to allow a team of researchers and accountants to make on-site visits rather than using the national probability sample approach with interviewers who cannot assist respondents in completing the questionnaire. Capital expenses should be examined over a long period of time (10 years) at the facility level as suggested by the National Association of Mental Retardation Program Directors report (1980). National mail surveys of PRFs and CRFs can

gather only limited data compared to an interview study and should be used in intermittent years. The type of questions that can be used in a mail questionnaire would be limited to the total operating budget and the per diem rates.

Once a national data bank on the numbers, movement, and cost of serving mentally retarded people in PRFs and CRFs is established, federal policy makers should combine these figures with trend information gathered for other residential options such as nursing homes and state and county mental hospitals.

From a federal perspective, all residential alternatives for mentally retarded people comprise a residential system. This total system must compete with other programs such as defense and education for scarce resources. As noted throughout this study, all too often the focus of competition for scarce resources has been on two options within the residential system, public and community residential facilities. By concentrating only on those two domains, policy makers have ignored thousands of mentally retarded people and billions of dollars spent on care in nursing homes, state and county mental hospitals, and correctional facilities.

Table 6.1 presents an example of combining census figures for several residential options and comparing the relative use and cost of each type of facility. The estimated number of mentally retarded people served by all these types of facilities totaled over 344,000 at an estimated cost of over $5 billion. The figures included in this brief schema meet several criteria described by Coleman (1972) as

Table 6.1

Estimated Costs of Residential Services for the Mentally Retarded

Source	Type of Facility	Time Period	Method	Facilities N	Total Residents N	MR Residents N	MR Residents %	Expenditures $	Average Yearly Cost Per Resident
Scheerenberger (1978a)	Public Residential Facilities	1977	Mail Survey - Census	263	153,000	152,000	98.8	$2,500,000,000	$15,700.00
National Center for Health Statistics (1979)	Nursing Homes	1977	Mail Survey - Sample	18,900	1,303,100	79,800	6.1	658,800,000	8,255.64
Bruininks, Hauber & Kudla (1979)	Community Residential Facilities	1977	Mail Survey - Census	4,427	76,300	62,400	81.8	344,416,000	5,840.00
U.S. Law Enforcement Assistance Administration (1979)	Federal & State Prisons	1977			278,100	26,400	9.5[b]	468,700,000	17,753.78
National Institute of Mental Health (1979)	State & County Mental Hospitals	1976	Mail Survey - Census	300	170,600	15,500	9.1	291,200,000	18,787.10
National Institute of Mental Health[c]	Private Psychiatric Hospitals	1975	Mail Survey - Sample		129,800[d]	600	.5	2,334,000	3,890.00 (short term stay)
National Institute of Mental Health	General Hospitals with Psych.	1975	Mail Survey - Sample		515,500[e]	2,400	.5	3,106,000	1,294.17 (short term stay)
Bruininks, Hill & Thorsheim (1980)	Foster Homes	1977	Mail Survey - Census[f]	2,609	5,000	5,000		15,800,000	3,160.00

[a] Percent of total residents

[b] Brown and Courtless (1971) 9.5% estimate

[c] Obtained by phone call to NIMH statistician Marilyn Rosenstein

[d] Total resident and MR residents based on annual admissions

[e] Total resident and MR residents based on annual discharges

[f] Includes only 20 states

critical to effective policy research. First, the figures can be compiled on a timely basis and second, the figures communicate effectively. By providing an overview of the entire residential spectrum, policy makers can examine the implications of moving large numbers of people from one placement to another.

Analytical Studies

Mayeda and Wai (1975) have asserted that federal and state policies for payments of human service delivery of care are not always consistent with the goals and objectives of human development. The reimbursement patterns for services should, in theory, represent the utilization of services according to the behavioral needs and profiles of individual clients. The current trends appear to be a reverse of that theory with those services which are more highly reimbursable utilized more heavily. A policy analysis of federal and state fiscal mechanisms should be designed to assess whether costs cluster in relation to state and federal budgets, policies, and limits. The current sample was a nationally representative group of facilities which prohibited state by state analyses to determine whether higher costs were associated with those states which had a greater commitment to human services.

At a state or local level, smaller studies should be designed to examine the relative efficiency of residential alternatives. In particular, costs should be related to measured outcomes such as resident growth and progress over time. Heal and Switzky (1976) proposed to study the cost effectiveness of community residential alternatives through assessment of individual outcomes (quality of life and competencies in social, vocational, and self help areas).

Cost Models

Building cost models may be a preferred planning approach in the future given an adequate base of cost estimates. In 1976, Peat, Marwick, Mitchell, and Co. developed cost estimates for various residential alternatives, as described in Chapter II. More recently, the Retardation Program Office of the Department of Health and Rehabilitative Services in Florida commissioned a study analyzing project costs of building facilities for severely/profoundly retarded individuals with multiple handicaps. Per person annual costs were estimated for residents living in three different options: 1) state institution, 2) a 24-bed developmental medical cluster calculated separately for state operation or private operation, and 3) five residential alternatives such as a group home for four, community training homes for one, two, and three residents, and a hub residence for eight residents calculated separately for state operation or private operation.

State operated facilities tend to run at higher costs because of salary levels and benefits. The funding for state institutions is primarily state appropriation while the other community placements used several funding sources with the greatest proportion covered by federal money such as Title XIX.

The projected cost of building new 8-bed facilities to house the remaining resident population at two state institutions totaled $35.5 million. This $48.00 per square foot figure was compared with several other types of facilities such as dormitories ($38.45), hospitals ($59.05), prisons ($48.50), and ICF/MR facilities ($42.86). Last of all, the report contained a brief outline for implementation.

The potential benefits of using cost models such as the Florida study include: a) preparation of a report that contains complete information rather than partial cost projections, b) timeliness in meeting legislative needs, c) correctness of predictions based on objective sources of information, and d) translation of a policy into concrete tasks with a timeline for implementation.

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APPENDIX A

Description of Sample Facilities

Table A.1

Distribution of the Sample of Public Residential Facilities for the Mentally Retarded, by Size Class and Geographic Region of the United States

Size Classes (Residents)		All Regions	Northeast	North Central	South	West
All Classes						
	N	78	23	19	25	11
	%	100.0	29.5	24.4	32.1	14.1
1,600 or more						
	N	14	6	1	4	3
	%	17.9	7.7	1.3	5.1	3.8
1,000 to 1,599						
	N	21	8	3	8	2
	%	26.9	10.3	3.8	10.3	2.6
500 to 999						
	N	28	5	10	9	4
	%	35.9	6.4	12.8	11.5	5.1
150 to 499						
	N	12	3	4	3	2
	%	15.4	3.8	5.1	3.8	2.6
Less than 150						
	N	3	1	1	1	0
	%	3.8	1.3	1.3	1.3	0

Table A.2

Distribution of the Sample of Community Residential Facilities for the Mentally Retarded, by Size Class and Geographic Region of the United States

Size Classes (Residents)		All Regions	Northeast	North Central	South	West
All Classes	N	180	38	67	32	43
	%	100.0	21.1	37.2	17.8	23.9
500 or more	N	4	2	2	0	0
	%	2.2	1.1	1.1	0	0
300 to 499	N	4	1	2	0	1
	%	2.2	.6	1.1	0	.6
200 to 299	N	8	1	2	4	1
	%	4.4	.6	1.1	2.2	.6
100 to 199	N	14	4	6	3	1
	%	7.8	2.2	3.3	1.7	.6
50 to 99	N	14	3	6	2	3
	%	7.8	1.7	3.3	1.1	1.7
20 to 49	N	22	4	9	4	5
		12.2	2.2	5.0	2.2	2.8
10 to 19	N	32	6	14	6	6
	%	17.8	3.3	7.8	3.3	3.3
7 to 9	N	26	7	10	5	4
	%	14.4	3.9	5.6	2.8	2.2
6	N	18	3	5	3	7
	%	10.0	1.7	2.8	1.7	3.9
5	N	11	2	4	2	3
	%	6.1	1.1	2.2	1.1	1.7
4	N	13	2	3	2	6
	%	7.2	1.1	1.7	1.1	3.3
3	N	5	1	2	0	2
	%	2.8	.6	1.1	0	1.1
2	N	5	2	1	0	2
	%	2.8	1.1	.6	0	1.1
1	N	4	0	1	1	2
	%	2.2	0	.6	.6	1.1

Table A.3

Sampling Rates[a] and Expected Sample Sizes for the Study of Community Residential Facilities and Their Mentally Retarded Residents, by Size Class, United States, 1977

	Size Classes (Residents)	Number in Population: Facilities	Number in Population: Residents	Facility Sampling Rates	Number of Sample Facilities	Expected Number of Residents in Sample	Within Facility Sampling Rates
	All Classes	4,427	62,397	---	180	1076[b]	1:58
1.	500 or more	4	2,316	1:1	4	40	1:58
2.	300 to 499	4	1,540	1:1	4	26	1:58
3.	200 to 299	8	1,963	1:1	8	34[b]	---[c]
4.	100 to 199	77	10,001	m_i:714.357	14	172	714.357:58m_i
5.	50 to 99	140	9,629	m_i:687.786	14	166	687.786:58m_i
6.	20 to 49	348	10,653	m_i:484.227	22	184	484.227:58m_i
7.	10 to 19	848	10,950	m_i:342.133	32	189	342.227:58m_i
8.	7 to 9	933	7,373	m_i:283.577	26	127	283.577:58m_i
9.	6	518	3,108	1:29	18	54	1:2
10.	5	312	1,560	1:29	11	27	1:2
11.	4	371	1,484	1:29	13	26	1:2
12.	3	315	945	1:58	5	16	1:1
13.	2	326	652	1:58	5	11	1:1
14.	1	223	223	1:58	4	4	1:1

[a]The overall sampling rate of 1:58 for residents has two components: Facility sampling rates and resident sampling rates within sample facilities. For size classes 4 through 8, the facility sampling rate was m_i/I_F, where m_i was the size measure (number of residents) assigned to the ith facility and I_F was determined by dividing the residents total by the number of sample facilities to be selected from a size class. The sampling rate within the facilities was $I_F/58m_i$.

[b]Expected sample sizes assuming a constant, overall rate of 1:58.

[c]Sampling rates varied from approximately 4:58 to 1:58. See discussion in report describing sample design.

Source: Population data provided by the research staff, University of Minnesota.

APPENDIX B

Financial Questionnaire

RESIDENTIAL FACILITIES FOR
MENTALLY RETARDED PEOPLE

Project 12
Fall, 1978

SURVEY RESEARCH CENTER
INSTITUTE FOR SOCIAL RESEARCH
THE UNIVERSITY OF MICHIGAN

1. Interviewer's Label

Facility Number _____ Date _____

FINANCIAL QUESTIONNAIRE

INSTRUCTIONS

Please use the Balance Sheets and Income Statements for the last complete budget year in completing the following questions. Accountants' financial statements will differ from government reports; therefore, responses from accountants' statements are preferred if available. Round off amounts to the nearest whole dollar.

This information will be kept strictly confidential and will be used only in reports presenting group summaries.

If your facility provides care for mentally ill or chemically dependent individuals as well as mentally retarded, give financial figures for mentally retarded persons only.

BUDGET YEAR

Please list the dates of the facility's most recently completed budget year. All questions should be answered using this same time period.

_____ ____ 19___ TO _____ ____ 19____
MONTH DAY YEAR MONTH DAY YEAR

2

I. SOURCES OF REVENUE

1. Please list the specific source of Government Funds and the amounts from County, Regional, State and Federal government sources (i.e., County Welfare, State Appropriation, Title XIX, Title XX).

A. GOVERNMENT REIMBURSEMENT AND SUPPORT

SOURCE (If no government support, enter none)	AMOUNT
_____	$ _____
_____	$ _____
_____	$ _____
_____	$ _____
TOTAL GOVERNMENTAL	$ _____

2. What amounts were received from residents' private funds (personal or family) or from residents' SSI or Social Security checks to support the operating budget of this facility?

B. SUPPORT FUNDS FROM INDIVIDUAL RESIDENTS

SOURCE (If no resident support, enter none)	AMOUNT
_____ _____	$ _____
_____	$ _____
TOTAL RESIDENT	$ _____

3. Please list all other sources of funds and amounts. Include donations, church support, United Way, contributions from Association for Retarded Citizens, special grants or gifts.

C. OTHER SUPPORT AND CONTRIBUTIONS

SOURCE (If no other sources, enter none)	AMOUNT
_____	$ _____
_____	$ _____
_____	$ _____
_____	$ _____
TOTAL OTHER REVENUE	$ _____

4. TOTAL FUNDS OR INCOME FOR THE YEAR ENDING

_____, 19 ____
MONTH DAY YEAR

(Add Subtotals 1, 2, and 3) . . . . . TOTAL REVENUE $ _____

3

II. EXPENSES

		AMOUNT
5.	PAYROLL EXPENSES	
	*A. Total payroll expenses	$ _____
	*B. Total payroll taxes including FICA (Social Security), Workmen's Compensation and Unemployment Compensation	$ _____
	C. Total paid for fringe benefits including group health, life insurance, retirement	$ _____
6.	CAPITAL EXPENDITURES	
	*A. Furniture and fixtures	$ _____
	*B. Equipment.	$ _____
	*C. Buildings.	$ _____
	*D. Leasehold improvements	$ _____
	*E. Land	$ _____
	TOTAL CAPITAL EXPENSE	$ _____
*7.	ALL OTHER EXPENSES (NONPERSONNEL AND NONCAPITAL).	$ _____
8.	TOTAL EXPENSES FOR YEAR ENDING _____ (MONTH) _____ (DAY), 19 ____ (YEAR)	
	(Add subtotals 5, 6, 7)	$ _____

III. PER DAY CHARGES AND COSTS

*9.	What was the average per day per person charge rate for a resident to live in this facility during the past year.	$ _____
*10.	What was the average per day per person cost rate for a resident to live in this facility during the past year.	$ _____

*Definitions of these items appear on the last page.

4

IV. GENERAL QUESTIONS

11. Is the expense total given in question 8 higher, lower or equal to the income total given in question 4?

☐ 1. Higher ☐ 3. Equal ☐ 5. Lower

12. Is the capital expenditure total given in question 6 higher, lower or equal to the capital expenditure total of a typical year?

☐ 1. Higher ☐ 3. Equal ☐ 5. Lower

13. Are the expense and income figures given on questions 1 - 8 for mentally retarded residents only?

☐ 1. Yes ☐ 5. No

*14. What percentage of the total operating expenses given in question 8 was used to provide structured daytime training and services, special education classes, work training or sheltered work employment rather than food and lodging? (If total in question 8 did not include such costs, enter "0" here.)

_____ PERCENT

15. Is your facility rented?

☐ 1. YES ☐ 5. No

15a. What was the total rent expense for the year ending _____, 19____ . . . . . $ _____
MONTH DAY YEAR If rent is given go to Q. 17

*16. What is the estimated appraised valuation of the land and buildings of this residential facility?. . . . . $ _____

*16a. If appraised valuation is unknown, what is the estimated market dollar value of the land and buildings?. . . . . $ _____

*17. What is the estimated market dollar value of the furnishings of this residential facility?. . . . . $ _____

*18. What was the total expense for repair and maintenance of capital items given in question 6? (Include labor costs). . . . . $ _____

19. What is the land area or lot size?

_____ ACRES OR _____ BY _____ FEET

20. Is this facility a non-profit or profit organization?

☐ 1. Non-profit ☐ 5. Profit

*Definitions of these items appear on the last page.

5

CLARIFICATION OF TERMS USED

Q. 5A TOTAL PAYROLL EXPENSE: All wages and slaries paid to employees, including payments for vacation, maternity and sick pay, terminal payments, payroll taxes and fringe benefits. In larger facilities with multiple cost centers, include a proportion of general administrative costs allocable to mentally retarded.

Q. 5B TOTAL PAYROLL TAXES: Include employers' portion of FICA, Federal and State Unemployment Insurance, Workmen's Compensation, etc.

Q. 6 CAPITAL EXPENDITURES: Costs for improvements. Include costs for long-term additions or benefits which are distributed over time.

Q. 7 OTHER EXPENSES (NON PERSONNEL AND NONCAPITAL): Include operating expenses for food, utilities, rent, transportation, supplies, taxes, non-capitalized equipment, professional dues, travel, etc.

Q. 9 CHARGE RATE: This would be the per day per person per diem charged for a resident to live in this facility. This figure might also be known as the reimbursement rate.

Q. 10 COST RATE: If the per day per person cost for a resident to live in this facility is known, please give this figure.

Q. 14 If this facility provides special training programs to residents in addition to room and board, please estimate what percent of those non-domiciliary expenses are represented in the total expenses (Q. 8). If the amount given in Q. 8 does not include expenses for other than room and board, enter "0" in Q. 14.

Q. 16 APPRAISED VALUATION: Appraisal of land and buildings by a professional appraiser, such as American Appraisal Company for large public facilities or FHA for residential homes.

Q. 16a - 17 MARKET VALUE: The estimated value of selling the property on an open market, given sufficient time and a willing buyer, as opposed to selling quickly on a liquidation basis.

Q. 18 REPAIR AND MAINTENANCE OF CAPITAL ITEMS: The costs of purchasing service from outside sources for maintenance and repair of buildings, equipment, furniture, and furnishings such as elevator, plumbing, electrical systems maintenance, and repair, etc. This would not include the costs of additions or other improvements to the buildings and grounds.

APPENDIX C

Short Form Financial Questionnaire

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SECTION E: FINANCES

E1. INTERVIEWER CHECKPOINT

☐ 1. FINANCIAL QUESTIONNAIRE WAS SENT AHEAD AND HAS BEEN FILLED OUT AND COLLECTED BY YOU ⟶ GO TO E2

☐ 2. FINANCIAL QUESTIONNAIRE WAS NOT SENT AHEAD OR WAS NOT FILLED OUT

E1a. INTERVIEWER CHECKPOINT

☐ 1. THIS IS A PUBLIC FACILITY (ID NUMBER STARTS WITH "0")

☐ 2. THIS IS A COMMUNITY FACILITY

SEE CREAM STAFF COMPOSITION INFORMATION SHEET FOR THIS FACILITY, Q. 1

E1b. ☐ 1. FACILITY EMPLOYS STAFF OTHER THAN FAMILY MEMBERS

☐ 2. FACILITY RUN ENTIRELY BY MEMBERS OF A SINGLE FAMILY ⟶ TURN TO P. 24, E3

E1c. We would like you, or your accountant, or whoever prepares your financial statement here, to fill out this Financial Questionnaire. (HAND R GREEN FINANCIAL QUESTIONNAIRE, ARRANGE FOR IT TO BE FILLED OUT AND DETERMINE WHERE AND WHEN YOU CAN PICK IT UP.)

PLACE _____ TIME _____

E2. (In addition) I want to leave this form with you. (HAND R GREY DIRECT CARE STAFF SEPARATIONS SHEET.)

One of the most difficult problems in residential facilities is recruiting and retaining qualified people to work directly with residents. We want to estimate the amount of employee turnover on a month-to-month basis, and to assess some of the reasons why people leave their jobs. We think this information can be helpful to administrators in reducing the costs of such turnover and in their attempts to recruit and hold good staff in residential facilities.

For this reason, we would like you to fill out this form regarding all direct care staff who formally separate from this facility for the next 30 days.

ASK R TO ANTICIPATE THE NUMBER OF DIRECT CARE STAFF SEPARATIONS DURING THE NEXT 30 DAYS AND LEAVE AN AMPLE SUPPLY OF FORMS.

GO OVER FORM AND INSTRUCTIONS WITH R AND ARRANGE TO:

1. HAVE R SEND IN THE FORM IN 30 DAYS (IF FACILITY IS 50 MILES OR MORE FROM YOU)

2. COME AND PICK UP THE FORM IN 35 DAYS (IF FACILITY IS LESS THAN 50 MILES FROM YOU)

TURN TO P. 27, SECTION F

24

F3. During the past year, have you received a monthly check for the care of the mentally retarded residents who live here?

1. YES → 5. NO → GO TO F3b

F3a. How much was the amount of the check?

$ _____ FOR _____ NUMBER RESIDENTS

(IF R INDICATES THERE WAS A DIFFERENT RATE FOR DIFFERENT RESIDENTS RECORD HERE)

RATE 1 $ _____ FOR _____ NUMBER RESIDENTS

RATE 2 $ _____ FOR _____ NUMBER RESIDENTS

RATE 3 $ _____ FOR _____ NUMBER RESIDENTS

F3b. Did you receive any other money last year to operate your home for the mentally retarded residents who live here? This does not mean money intended for residents' personal use.

1. YES → 5. NO → TURN TO P. 25, E4

F3c. How much money was that for the entire year?

$ _____

25

E4. What were your total expenses for 1977?

$ _____

(IF R'S RECORDS ARE FOR A FISCAL YEAR INDICATE DATES BELOW)

FROM _____ TO _____

E4a. Did you have any staff to help you operate this home during last (fiscal) year?

1. YES

5. NO → GO TO E5

E4b. How much did you spend for wages, payroll taxes and fringe benefits for the staff employed last year?

$ _____

E4c. How much of the total amount (E4b) was for payroll taxes?

$ _____

E4d. How much of the total amount (E4b) was for fringe benefits?

$ _____

E5. Do you own this home, rent it, or what?

1. OWNS OR IS BUYING

3. NEITHER OWNS NOR RENTS (SPECIFY): _____

2. RENTS

E5a. What is the appraised value or market resale value of this home?

$ _____

E5b. How much did you pay for rent last (fiscal) year?

$ _____

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E6. Last (fiscal) year did you spend any money on remodeling, new furniture or equipment for the mentally retarded residents who live here?

1. YES

5. NO → TURN TO P. 27, SECTION F

E6a. How much did you spend last year?

$ _____

E6b. Were the costs for remodeling and equipment higher, lower or about the same as in other years?

1. HIGHER

5. LOWER

3. SAME

APPENDIX D

Sampling Errors

Table D.1

Approximate Standard Errors and Coefficients of Variation for Five Estimated Cost Items for Public Residential Facilities for the Mentally Retarded

Item	Estimate (millions)	Standard Error (millions)	Coefficient of Variation (%)
Total Revenue	$2,626.6	81.5	3.10
Total Payroll Expenses	$2,157.8	62.4	2.89
Total Capital Expenses	$ 140.9	20.1	14.30
All Other Expenses	$ 426.5	29.9	7.00
Total Expenses	$2,735.5	81.3	2.97

Note: Estimates provided by Irene Hess, PhD, Director of Sampling Section, Survey Research Center, University of Michigan.

Table D.2

Approximate Standard Errors and Coefficients of Variation for Five Estimated Cost Items for Community Residential Facilities for the Mentally Retarded

Item	Estimate (millions)	Standard Error (millions)	Coefficient of Variation (%)
Total Revenue	$484.046	22.721	4.69
Total Payroll Expenses	$267.605	15.976	5.97
Total Capital Expenses	$ 59.989	13.290	22.15
All Other Expenses	$193.521	10.036	5.19
Total Expenses	$517.815	27.780	5.36

Note: Estimates provided by Irene Hess, PhD, Director of Sampling Section, Survey Research Center, University of Michigan.

Sampling Errors

The results reported in this study were derived from a sample survey and not the complete population. There are two basic types of errors that affect sample surveys - sampling errors and nonsampling errors. Sampling error is defined as a measure of the variation among the estimates from all possible estimates, and thus is a measure of the precision that an estimate approximates the average result of all possible samples. For example, the particular sample used in this survey is one of several possible samples that could have been selected using the same sample design. Estimates derived from each sample would differ from each other with the sampling deviation defined as the difference between a sample estimate and the average of all possible estimates. Nonsampling errors have been defined as including a wide range of issues from definitional problems and missing data to coding, processing, and imputation errors. The accuracy and precision of population estimates presented in this report are determined by both sampling and nonsampling errors.

The estimated totals were obtained by inflating the reported data for each facility by the reciprocal of the selection probability for the facility. The formula for the calculation of approximate standard errors is that given as Model II Form (a) in Kish and Hess[1], (1959):

$$\text{Standard error } (y) = \left[\sum_{h-1}^{H} \frac{G_h}{2(G_h-1)} \sum_{g=1}^{G_h-1} (y_{gh} - y_{gh+1})^2 \right]^{1/2}$$

where y = cost estimate

y_{gh} = weighted total for the g^{th} facility in the h^{th} size stratum

G = number of sample facilities in the h^{th} stratum

H = number of size strata

As presented in Tables D.1 and D.2, the sample estimate and an estimate of its standard error permit us to construct interval estimates with prescribed confidence that the interval includes the average result of all possible samples (for a given sampling rate).

To illustrate, if all possible samples were selected, with each of these samples surveyed under essentially the same conditions, and an estimate and its estimated standard error calculated from each example, then:

a) Approximately 2/3 of the intervals from one standard error above the estimate would include the average value of all possible samples. We call an interval from one standard error below the estimate to one standard error above the estimate a 2/3 confidence interval.

b) Approximately 9/10 of the intervals from 1.6 standard errors below the estimate to 1.6 standard errors above the estimate would include the average value of all possible samples. We call an interval from 1.6 standard errors below the estimate to 1.6 standard errors above the estimate a 90 percent confidence interval.

c) Approximately 19/20 of the intervals from two standard errors below the estimate to two standard errors above the estimate would include the average value of all possible samples. We call an interval from two standard errors below the estimate to two standard errors above the estimate a 95 percent confidence interval.

d) Almost all intervals from three standard erros below the sample estimate to three standard errors above the sample estimate would include the average value of all possible samples.

The average value of all possible samples may or may not be contained in any particular computed interval. But for a particular sample, one can say with specified confidence that the average of all possible samples is included in the constructed interval.

In the last columns of Tables D.1 and D.2 are the coefficients of variation. The coefficient of variation is the relative standard deviation, free of the units in which the estimate is measured. The smaller the coefficient of variability, the more precision. The relative standard error is defined as the standard error of the estimate divided by the value being estimated. Coefficients of variation were calculated before dollar values were rounded.

[1]Kish, L. & Hess, I. On variances of ratios and their differences in multi-stage samples. Journal of the American Statistical Association. June, 1959, 54, 416-446.